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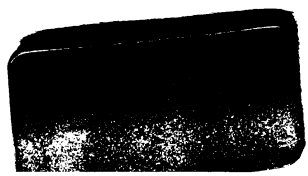
*The Botany of Worcestershire*

Edwin Lees





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*J. H. Whitley*  
*Peduncle Rectory*

THE  
BOTANY OF WORCESTERSHIRE,  
OR THE  
DISTRIBUTION  
OF THE  
INDIGENOUS & NATURALIZED PLANTS  
OF THAT COUNTY,

WITH DESCRIPTIONS OF THE MOST REMARKABLE  
LOCALITIES FOR BOTANICAL OBSERVATION,  
INCLUDING SKETCHES OF THE PHYSICAL GEOGRAPHY OF WORCESTERSHIRE  
IN FOUR BOTANICAL DISTRICTS, AND A  
TABULATED ARRANGEMENT OF PLANTS,  
SHOWING THEIR FREQUENT OR RARE OCCURRENCE IN EACH DIVISION.

BY EDWIN LEES, F.L.S., F.G.S.,  
FELLOW OF THE BOTANICAL SOCIETY OF EDINBURGH; HONORARY MEMBER OF  
"LA SOCIÉTÉ MURITHIENNE DE BOTANIQUE DU VALLAIS," SWITZER-  
LAND; VICE-PRESIDENT OF THE WORCESTERSHIRE AND  
MALVERN NATURALISTS' CLUBS, ETC.

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WORCESTER:  
PRINTED FOR THE WORCESTERSHIRE NATURALISTS' CLUB.

1867.

## BIOLOGY

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—“Ego apis Matinæ  
More modoque,  
Grata carpentis thyma per laborem  
Plurimum.”

HORACE, Carm. iv., Ode ii.

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“It is our duty as practical observers to collect facts.”—*Sir J. E. Smith*  
*in English Botany.*

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“Science of the green earth wide,  
Science of the lone hill side,  
Of the wood, and of the dell,  
Where the living waters well,  
Of the herb and of the tree,  
I do owe a debt to thee;  
I have owed it long, and now  
When thy fairy children bow  
Round me, flourish, breathe, and blow,  
It is time to cease to owe.”

*Howitt's Ode to Botany.*

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## PREFATORY NOTICE.

THE collection of materials for this work has taken up a much longer time than was originally calculated upon, and the plan extended itself with years of observation. This necessitated alterations and additions after some portion of the book had been printed, and it thus lay quiescent for a considerable time, like a sylvan plant obstructed in its growth by over-arching underwood. This must account for the work forming three parts or sections. The "Introduction," treating of various subjects connected with the limitation, migration, and localization of plants, with notices of rainfall, temperature, &c., as well as critical remarks, speaks for itself; while the general body of the essay describes the local distribution of the Plants of Worcestershire, and their occupation of particular and remarkable localities. The third part tabulates all the plants that have been observed in Worcestershire, whether indigenous, introduced, or naturalized, in four botanical districts or divisions, which are at once obvious in the annexed map. To fill up these columns has been a work of time, as well as labour and care, but the result is a more complete view of the Botany of Worcestershire than was ever before presented to the botanical world. It may be easily understood that no single observer was sufficient to mark every secluded spot within the county limits, and several acute members of the Club have rendered efficient aid in marking the location of plants in the divisions tabulated. They have honourable mention farther on, but it is but justice to my accomplished friend Mr. W. Mathews, jun., to say, that his zeal and accuracy have been of the utmost service, and without his assistance, kindly supplied from time to time, this work could scarcely have been completed.

*Worcester, July, 1867.*

E. L.



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**WORCESTERSHIRE NATURALISTS' CLUB,**  
**FROM ITS FORMATION IN 1847.**

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INTRODUCTION  
TO THE  
BOTANY OF WORCESTERSHIRE,  
AND THE DISTRIBUTION OF ITS  
INDIGENOUS PLANTS.

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As some time has elapsed since the following essay was commenced, an introduction to it, and remarks in connection with the appended tabular enumeration of Worcestershire native plants has become necessary. My original intention, in accordance with the wishes of the Club, was to note the localities of the rarer plants of the county, and indicate places of the greatest interest to the collecting botanist. It was further determined to divide the county into districts, and compare the vegetation of each district in a tabular form. Some difficulty was, however, found in defining well-marked districts, and still more in ascertaining what plants were certainly absent or present in each of them, and hence an unexpected delay has occurred in printing the combined result of numerous observations. But the delay has been advantageous in obtaining fuller information, and detecting many plants that had previously escaped notice, while doubtful ones have had a careful review, so that any botanist who consults these pages either for local or general purposes, may feel satisfied that there is *good authority* for all the species named as gathered; for I have deferred to the judgment of other botanical members of the Club on any dubious point, and in particular the tabulated list has been gone over carefully many times. While the Malvern division has been

more peculiarly my own, the following friends have given effectual aid in filling up the columns of the other districts—especially I may mention MR. W. MATHEWS, JUN., the REV. J. H. THOMPSON, MR. T. BAXTER, of the Cathedral School, Worcester, and MR. THOMAS WESTCOMBE—all most accurate observers. Nor can I forget my venerable friend MR. G. JORDAN, who has so often led me over the glades and copses of Wyre Forest.

Having attended to the native plants of Worcestershire for more than thirty years, I may be supposed to have a tolerable familiarity with them, and I am, therefore, desirous that this essay shall be an assistance to phyto-geographical science as far as Worcestershire is concerned. In the list of county plants given in the "New Botanists' Guide through England and Wales," which Mr. H. C. Watson edited a quarter of a century ago, there were a few errors among the Worcestershire plants recorded, which at that time could hardly be avoided when zeal and enthusiasm were somewhat in advance of practical knowledge. But *experientia docet*, and as errors when once detected are not likely to be repeated, so it is to the local observer that general writers ought to look for facts not within their own cognizance. Yet it is astonishing how writers devoted to a particular subject, sometimes neglect the very means within their grasp that might enable them to render laborious works on which they employ their time more perfect, either from an indisposition to seek evidence, undervaluing statements already made in print, or a prejudice against certain books or persons from whom information could be positively obtained.

Local research in the case of the rarer plants is of very considerable importance, though compilers of general voluminous works do not avail themselves of local aid to the extent they might and ought to do. This is observable in the case of Mr. Watson's "Cybele Britannica,"\* as I may as well proceed

\* I have no wish to undervalue the amount of information accumulated in this extended work, and touch only upon what has especial reference to Worcestershire—which, as my "province," I hold myself authorized to determine as to the plants belonging to it.

to show in one or two cases, and several more might be given. *Cynoglossum sylvaticum* is marked in his latest published list as requiring due authority, or "a more reliable record," for its growing in his "Mid-Severn" sub-province (*Hereford, Worcester, and Warwick*). Now, if pique and prejudice are put aside, where are we to look for more reliable evidence than is already given? The plant is mentioned distinctly as having been noted on the Pershore road, near Worcester, in Dr. Nash's list of plants given in his folio "History of Worcestershire." Nash probably gathered this information from others, but the "good authority" of Purton's "Midland Flora" declares the *Cynoglossum* to have been actually gathered "near to Evesham, on the Fladbury road," by the late Mr. E. Rudge. This brings us down to 1821, but further corroboration appears in the list of plants given in Dr. Hastings's "Illustrations of the Natural History of Worcestershire" (1834), which had the careful revision of two local botanists, one of whom was the late Dr. Streeten. Again, in my "Botany of the Malvern Hills" (2nd Edit., 1852), the localities of the *Cynoglossum sylvaticum* are thus recorded:—"At the eastern base of Warren Hill, near the Gullet. Also by the side of the road near Longdon Church." I may as well here remark that this very year (1866) I have gathered the *Cynoglossum* at a spot near Tewkesbury, from whence it is never absent. With this positive evidence at so late a date, surely an author must be very forgetful or very inconsistent, who demands on the one hand more authority for the existence of a plant so easily determined as the *Cynoglossum sylvaticum*, while on the other he denounces "printing records at random nine-tenths of them valueless *because mere repetitions*."\* The truth is that repetitions are valuable, and it is here shown, spite of Mr. Watson's demurrer. He would disbelieve Purton or the Malvern Botany, but if some person utterly unknown sent him the record "near Longdon Church," it would be received as "good authority," and lauded as such, although a mere repetition. It

\* Cyb. Brit. *in loc*.

is this determination to exclude the evidence of any person with whom he has had a difference, that is a spot upon and subtracts from the value of Mr. Watson's industrious and voluminous labours in British Botany. The same thing occurs with respect to *Helleborus viridis*, also recorded in the "Botany of the Malvern Hills," *Reseda lutea*, *Spergularia media*, *Ceratophyllum submersum*, *Smyrniolum olusatrum*, *Galium erectum*, and *Verbascum virgatum*. I have only alluded to those instances where my own evidence is called in question; but there are many instances where the authority of Purton's "Midland Flora" is equally disregarded, though Mr. Purton was considered a very exact botanist by the late Sir James Smith. If evidence is disregarded or rejected on mere personal grounds, it must be *repeated* till it is respected, and here the aid of members of a club working together is of considerable use. No doubt many a botanist (perhaps *everyone*), at an early period of his course, has fallen into some errors of designation which later judgment corrects; but it is absurd to reject the testimony of an observer who has continued his studies, on the ground that years ago some of his designations were then erroneous. A curious and illustrative instance of capriciousness in receiving one plant, and requiring corroboration for another, is shown in the list published in the first part of the Supplement to "Cybele Britannica."\* The *Epipogium aphyllum* is admitted as a true native of the Mid-Severn sub-province on "good authority;" but the *Spiranthes æstivalis* wants a "more reliable record," though the evidence for the appearance of the plants is really equally good in both cases to any unprejudiced mind, and neither are now to be found at the localities where they were gathered. As regards the *Epipogium*, a flowering stalk of it was gathered by Mrs. Anderton Smith at Tedstone Delamere, in 1854, and the root was afterwards too unadvisedly dug up and planted in the rectory garden, where it died, as might have been expected, never producing any more flowers, and no other specimen has been found,

\* This Supplement I only received through the Rev. J. H. Thompson.

though Mr. T. Westcombe and myself have made diligent search year after year. I believe only three flowering stems were observed, one of which fell into Mr. Watson's hands, and another into mine. After I had sketched and described my specimen, I sent it to prevent future dispute to the Linnæan Society. So far there can be no doubt that the *Epipogium aphyllum* once appeared at Tedstone. The *Spiranthes æstivalis* was gathered on the edge of the great bog in Wyre Forest by Mr. George Jordan, a well known botanist of Bewdley, the same year, in company with Mr. T. W. Gissing (now of Halifax) and another young chemist from Worcester, to one of whom Jordan gave the plant, and I afterwards saw the specimen mounted in the young chemist's herbarium. It was truly *Spiranthes æstivalis*, but I in vain tried to obtain the specimen for the Herbarium in the Worcester Museum. Now it appears to me that the evidence is equally good for the *Spiranthes* as the *Epipogium*, there being four witnesses to the former; and yet Mr. Watson in his list demands for the *Spiranthes* a further corroboration, which of course is unattainable, and which would only be a *repetition* if again stated to be found at the locality, and which re-asserted statements he condemns. For my own part I consider that the evidence of both accounts to be equally good and reliable, and should be marked as such. I should, nevertheless, be glad to hear that the *Epipogium* as well as the *Spiranthes* had been again found.

I shall now proceed to advert to several points that seem to require distinct notice, and will elucidate the *tabular arrangement of Worcestershire plants* appended to this essay, where the county vegetation forms *four divisions*. First, as to the

#### LIMITATION OF SPECIES TO PARTICULAR LOCALITIES.

In discoursing upon the distribution of native vegetation, it is of course necessary to allude to Mr. Watson's great work entitled "*Cybele Britannica*." The county of Worcester is there included in the "*Severn Province*," which groups together the

counties adjacent to the river Severn from Salop and Stafford (the latter county barely touching the Severn) to Monmouth at the mouth of the Wye. This extent of country is rather incongruous, but in Mr. Watson's supplemental arrangement he makes a "sub-province" of *Worcester, Hereford, and Warwick*, which is a much closer approximation to a good botanical division of country, as there is no natural boundary between these counties, so that there are few plants but what are common to the three. This essay may well, therefore, be considered as illustrating the vegetation of this *sub-province*, and it is a relief not to be too closely confined to a comital boundary, for the boundary line of Worcestershire is so waving and irregular, that in many instances, when on the border, I have been uncertain in what county I was in without consulting the parish map. The spot where the leafless orchid *Epipogium aphyllum* was found, though in Herefordshire, is a very short distance from the parish of Clifton, in Worcestershire, and in several other cases it has been rather difficult to make out the county location of a plant with absolute certainty. *Gagea lutea* only grows at a part of Mathon parish so close to Herefordshire that the parish map alone proved the spot to be *within our county*, and that by a mere turn of the brook flowing near the spot. So where Dowles Brook flows through Wyre Forest, one side of the brook is Salop, and the other Worcester, and every plant in the forest is not common to Salop and Worcester. *Geranium sanguineum* keeps to the Salopian side in general, though a stray plant has been found occasionally "over the border;" while just the reverse is the case as to *Epipactis ensifolia*.

Several plants are truly confined to the Oölite of Gloucestershire, and strictly considered, have no place in the "sub-province" mentioned. Such are—

*Anemone pulsatilla*  
*Arabis hirsuta*  
*Thlaspi perfoliatum*

*Pyrus Aria*  
*Asperula cynanchica*  
*Cineraria campestris*

Yet, if insisting on a comital position, the *Thlaspi perfoliatum* has been found actually located at Evenlode, an isolated portion

of Worcestershire in the Cotswolde country, and it is not improbable that the plant may spread about Broadway, as broken up quarried ground may invite it. *Polypodium calcareum*, gathered by Mr. Westcombe, near Broadway, so near the border as to be doubtful whether the spot was in Worcestershire or Gloucestershire, is a Cotswolde fern, and certainly unknown in this county away from the oölite, to which formation it appears to be very partial.

Bredon Hill, however, though an "outlyer" of the oölite, is truly a Worcestershire eminence, and nourishes three plants unknown in any other portion of the county—*Astragalus hypoglottis*, *Hippocrepis comosa*, and the little Quinancy-wort (*Asperula cynanchica*). *Scabiosa Columbaria*, *Carduus acaulis*, and *Thymus Acinos* are also peculiarly abundant here. Of course the calcareous soil of this table land is favourable to many *scented herbs* that delight in broken stony spots, and it may be said of Bredon as Clare has apostrophized one of his thymy greens—

"Thou hast fragrant herbs and seed  
Which only garden culture need;  
Thy Horehound tufts I love them well,  
And Ploughman Spikenard's spicy smell;  
Thy Thyme, strong-scented, 'neath one's feet,  
And Marjoram beds so doubly sweet."

Indeed on the hill above Overbury is one of the few places in the county where Marjoram (*Origanum vulgare*) can be truly considered as growing plentifully in a wild state.

*Aconitum Napellus* is found in the vicinity of Tenbury, chiefly on the banks of a brook flowing into the Teme out of Shropshire, and doubts have been suggested as to its true nativity at the spot. The agency of the stream may have extended it from the vicinity of Ludlow and Cainham Camp, where it is in force, but I found the plant growing in an alder swamp on Eastham Hill, at above 500 feet elevation above the Teme valley, in a position quite accordant with its place of growth in Switzerland, and where not near any habitation, so that there was no probability of its having been scattered by any human hand.



*Myrrhis odorata* is another plant that is only to be found in one locality, near Southstone's Rock, Stanford, and a hermitage long existing at this singular mass of travertine, it has been suggested that the *Myrrhis* may have escaped from the hermits' garden here. If so, *Helleborus fœtidus* is the only other plant that, with the *Myrrhis*, has escaped the destruction of the hermitage, and as I know not why they might not both have been here ere the hermitage had a being, I shall give them the benefit of the doubt, trusting they may yet both long maintain their position here.

*Tulipa sylvestris* is an uncommon plant in the county, but has been known to occupy a little copse at the south end of the red marl cliff at Clerkenleap, two miles below Worcester, on the Severn bank, for almost half a century. It does not, however, flower every year, and whether truly indigenous at the spot may be doubtful.

*Isatis tinctoria* (the Woad) is constant to the bare cliff of red marl at the Mythe, near Tewkesbury, on the side of the Severn, where living observers have known it for fifty years; and probably it has occupied that precipitous place for centuries, and where it cannot easily be interfered with.

A few other limitations of species to a narrow space occur, though not perhaps so remarkable as the above mentioned. *Sedum album*, indubitably indigenous, though very dwarf, on the Malvern syenitic rocks; *Lathyrus palustris* by the side of Longdon Marsh; *Daphne Mezereum* in woods at Shelsley; *Vicia lathyroides* and *Hypochaeris glabra* on Hartlebury Common; and *Actinocarpus Damasonium*, only occurring by a pool near Tenbury, may be adduced.

*Thalictrum minus* may be mentioned as only inhabiting Wyre Forest in this county; and *Geranium pyrenaicum* always abounding in a particular pasture at St. John's, near Worcester, can scarcely be met with certainly elsewhere, except near Bewdley. *Rosa Sabini*, a beautiful and remarkable rose, which no exact observer could mistake, has long maintained itself at Cruck-

barrow Hill, near Worcester, with extraordinary pertinacity; and among the puzzling Rubi, the red-flowered *R. Sprengelii* can only be found among the defiles of Bromsgrove Lickey.

So also *Oenanthe pimpinelloides* and *Æ. silaifolia* are limited to the meadows by the Severn and Teme south of the city of Worcester; and *Bupleurum tenuissimum* is still more confined to the bare gravelly soil near Malvern. *Caucalis daucoides* and *Vicia Bithynica* are also confined to a few particular spots. The same may be said of the uncommon *Valerianella eriocarpa*; and even *Pulicaria vulgaris*, perhaps from extensive cultivation and draining, is now only known in one locality. *Lactuca Scariola* comes under the same category, and *Samolus Valerandi*, probably once commoner, is now quite a rare plant. The little water-plants *Elatine hexandra* and *Hydropiper* only grow within the county at one pool close to Churchill, near Kidderminster, and there they were collected by a passing botanist, Mr. A. Irvine, of Chelsea. Some species like *Euphorbia platyphylla* and *Cynoglossum sylvaticum* have almost died out, though gathered by competent botanists in former times, and the felling of old woods have left but little space for shrubs like the Juniper (*Juniperus communis*), now almost destroyed in Worcestershire, and only existing in very small quantities on the Craycombe Hills, and on heights between Malvern and Cradley. *Cephalanthera ensifolia* is another plant very local, and would entirely perish if the few forest places where it grows were to be stubbed up. *Orchis ustulata* is only met with on two or three calcareous hills. *Juncus obtusiflorus* I have only gathered in the Welland marshes, and some of the *Potamogetons* seem a good deal restricted in their localities—*P. densus* for instance, not hitherto noticed out of the Avon division. *Carex montana* has not been observed in this county out of Wyre Forest, while *Carex elongata* I have only seen in one spot near Hartlebury Common. Among grasses, *Melica nutans* is chiefly confined to Wyre Forest, *Festuca sylvatica* to Shrawley Wood, and *Hordeum sylvaticum* to the Malvern western woods.

There are other plants now local or scarce, that must at a former period previous to enclosures and increasing cultivation have been much more extended than they are now found to be. Such are—

Ranunculus Lingua	Vaccinium Oxycoccus
Berberis vulgaris	Pyrola media and minor
Hypericum elodes	Menyanthes trifoliata
Genista anglica	Cynoglossum sylvaticum
Spiraea filipendula	Melittis Melissophyllum
Comarum palustre	Hottonia palustris
Rosa Sabini	Lysimachia vulgaris
Pyrus torminalis	Polygonum Bistorta
Inula Helenium	Nartheacium ossifragum
Gnaphalium sylvaticum	Schœnus nigricans
Wahlenbergia hederacea	Cladium Mariscus
Erica Tetralix	Rhyncospora alba

So also with the *Eriophora*, which have become extinct in several places within my remembrance by the drainage and obliteration of bogs. Perhaps the Barberry (*Berberis vulgaris*) is the only plant that has been purposely rooted out, from a prevalent idea that it had a blighting influence on the corn. It certainly nourishes a fungus called *Æcidium berberidis*, and this is now declared to be only another form of the *Puccinia graminis*, so injurious to the culms of wheat. If this be so, we must acknowledge the observation so long disputed as to the effect of the Barberry was a just one.

#### SUDDEN APPEARANCE OF PLANTS IN PARTICULAR PLACES.

The circumstance of rare plants suddenly appearing at a spot where they were unknown before, and where they cannot again be found, is with difficulty explainable, but it is suggestive that evidence is not to be ignored because it may be considered as improbable. I have myself had occasion to notice in Worcestershire that some plants recorded by botanists of the last century, as found at particular places, after being lost for many years, had again recurred near the same spot where previously found. On the other hand, I have gathered plants at a locality where afterwards I failed to find them on the closest search. Changes in vegetation are perpetually going on, and they need

not excite surprise, except in extraordinary cases. Seeds must be blown about by winds often from considerable distances, and it is more probable that alighting on congenial soil they should grow and flourish there for a time, than that long-buried seeds should vegetate by being accidentally turned up.

“ How many plants—we call them weeds—  
 Against our wishes grow;  
 And scatter wide their various seeds  
 With all the winds that blow.”

Millions of seeds must be scattered and blown about that perish without finding a soil on which they can grow and increase, and when they do find a place of repose they alight upon it and struggle with each other for the possession of the ground. Several botanical friends have expressed an objection to admitting this action of the winds, which must, however, always be progressing more or less. It cannot be doubted that the Mosses on housetops spring up there from germs deposited by wind and rain, and surely the phanerogamous plants in like manner have their seeds wafted often from a distance to soil fitted for their purposes. Ferns are often to be seen making verdant the side of a well, a congenial locality which their spores have found out. I have never myself observed *Turritis glabra* in the Malvern district, but Sir William Guise, Bart., detected a specimen of it growing on a wall, near Brompton, which he gave me. The seed that produced this plant must certainly have been conveyed from a considerable distance. It seems more difficult to suppose *orchideous* seeds carried far away, and yet it must be so. *Orchis pyramidalis* is almost entirely confined to calcareous soil; yet I once found a single plant flowering within a little copse on the red marl close to Worcester. It however continued there only one season, and the same thing might happen as to other orchids. Professor Buckman discovered *Epipactis ensifolia* one season in Oakley Park, Gloucestershire, but could never find it again.

With composite plants having feathery seeds there can be no difficulty, for they may be wafted to any distance. The fact is,

that exposed fresh soil is certain to invite immigration, and though the nearest plants would probably deposit their seeds there, yet some must be blown at a tempestuous time from a very considerable distance. For an indeterminate period they will take possession of the ground, just as epiphytes may get upon trees, but except in particular cases they will not be able to maintain themselves, but gradually die away. I remember a new embankment being made along the side of the river Teme at Wick, near Worcester, and this embankment was covered the following year by a profuse growth of *Cardamine impatiens*; but the plant diminished in numbers every year, and now scarcely a single specimen can be met with on the bank of the stream. The Chick or Choak-weed (*Stellaria media*) will in fallow fields accumulate occasionally in a similar manner. So Lord Macaulay, in his History of England, mentions a Belgian battle-field, whose boundaries of slaughter were clearly shown the next year by the multitudes of scarlet poppies that crowded the plain. "The next summer after the battle of Landen in the Netherlands (fought between the French under Marshal Luxembourg and the allies), the soil fertilized by twenty thousand corpses, broke forth into millions of poppies. The traveller, who on the road from Saint Tron to Tirlemont saw that vast sheet of rich scarlet spreading from Landen to Neerwinden, could hardly help fancying that the figurative prediction of the Hebrew prophet was literally accomplished—that the earth was disclosing her blood, and refusing to cover the slain."\* Nevertheless, the mere spilling of the blood of soldiers on the ground would not have caused the poppies to appear unless the soil had been disturbed. Indeed the year after the ground was excavated for the Severn Valley Railway between Stourport and Bewdley, the mass of scarlet poppies (*Papaver rhæas*) that lined the embankment for miles was wonderful to behold, the seeds from possibly a few poppies having been widely thrown about by the operations of the workmen. Yet, though probably many of the

\* Macaulay's Hist. in loc.

poppies seeded, this extraordinary profusion has not been maintained.

Old willows by the banks of rivers often get covered by a growth of strange epiphytes, and on some of these on the banks of the Teme, and by Laughern Brook, near Worcester, I have seen *Veronica Buxbaumii* and *Tanacetum vulgare*, as well as many other commoner plants. Such immigrations are common, and occasionally a colony will maintain and extend themselves, as I have seen the Soapwort (*Saponaria officinalis*) and *Coronilla varia* do on the banks of the Severn. I once saw quite an army of *Oenothera biennis* squatted upon the side of Brean Down, Somersetshire, where patches of ground had begun to be cultivated, and some of them left neglected after a time for anything to come by chance as it might —

—“The flowers of waste,  
Planted here in nature's haste.”—*Clare*.

It has been a favourite idea to consider the sudden appearance of plants of uncommon occurrence in the neighbourhood, to be due to the exhumation of long-buried seeds, though this is quite a gratuitous assumption, for seeds are valued by gardeners according as they are fresh, and those long-gathered held as almost valueless.\* In the Transactions of the Woolhope (Herefordshire) Club, a curious case is recorded of the *Hyoscyamus niger* (Henbane) springing up on some soil recently dug out of a grave in Pembridge church-yard, and the worthy rector (the Rev. J. F. Crouch) not having before noticed the *Hyoscyamus* in his neighbourhood, thought the seed of it must have been disinterred from the grave. But church-yards and such neglected spots are just the localities that the Henbane delights to revel in, and a former plant may have lurked not far off, though unseen by Mr. Crouch. But I can produce an

\* Experiments on this subject were made in the Oxford Botanic Gardens a few years ago, as I was informed by Mr. Baxter, the Curator, and these have been recorded in some of the scientific periodicals. The result was the increasing sterility of seeds after four years old, and none vegetated that had been gathered twenty years.

analogous case with respect to the same plant, where it could only have been produced from a vagrant seed. When on a visit to my friend the Rev. R. Pilson, at Birtsmorton, I happened to wander into an orchard of his a few fields from the rectory, and here I observed some young apple trees had been planted the year before, and enclosed as usual with protective fencing. On the new soil within the fencing surrounding one of these apple-trees a fine *Hyosciamus* had fixed its seat, though in that vicinity I had not previously observed it. But still more certain as the product of seed blown about, was several specimens of *Epilobium angustifolium* growing within the neglected rotting bole of an overturned willow in the next meadow! Winds and birds are no doubt the great disseminators of seeds, and thus plants are enabled to get into curious positions—just as I have seen *Centranthus ruber* on Chepstow and other Monmouthshire castles, and the wild cherry-tree forming quite a colony on the battlements of Newland Church, Gloucestershire. Yet Mr. Flavell Edmonds communicated to the Woolhope Club a paper on various plants suddenly appearing on a railway embankment at Hereford, which he contended must have arisen from long-buried seeds. There were only seven enumerated, and three of these were such wandering Composite plants as *Carduus Marianus*, *Matricaria Parthenium*, and *Chrysanthemum segetum*. One might as well believe that a crop of Groundsel in any arable ground left neglected for a short time had risen up from seeds long buried there. According to the proverb, “Ill weeds spring up apace” everywhere, but it is generally from seed very recently deposited.\*

It may seem more probable that dormant seeds are awakened to life, where after coppice-wood is cut down, an astonishing number of plants often of the same species revel in the newly-

\* In September, 1865, Dr. Bull, of Hereford, detected a quantity of *Xanthium spinosum* springing up on a spot of waste ground near Hereford Infirmary, where manure and rubbish from the town had been deposited. The sagacious doctor did not believe that this Mediterranean plant had sprung from buried seeds, but transported ones.

exposed ground. But even here the plants probably arise from seeds only a few years old, or else the species apparent are those that, like orchids having bulbs that increase, can preserve an underground life for a long time without flowering until the impulse of light and temperature is allowed them. Shrubs that increase by suckers like the Raspberry, may spread a long distance beneath the soil, and be precluded from an upward growth by too great a depth of shade. But when the coppice-wood which has overpowered them is cut down, they re-appear, and take advantage of the opportunity to grow up and flower. Thus it is that particular plants swarm at times in woods and then are lost for some years after the thick coppice has grown again.

Not long since I observed the recently cleared space of a wood at Hampton Lovett quite ruddy with a flowering host of *Lychnis diurna*. But I found that a neglected plant of this species on the edge of the wood might in one season produce more than two thousand seeds, which would be easily dispersed, so that the apparent increase of the *Lychnis* on the cleared space in the wood might be from seeds of not very old growth. Indeed the produce from a single unobserved weed on the side of a hedgerow near arable ground is so great that Professor Buckman (late of the Royal Agricultural College), in pressing the destruction of all weeds upon careless farmers, has emphatically declared that a single weed permitted to vegetate is quite sufficient to cover a farm. I have observed in some years an amazing spread of *Campanula patula* in Shrawley Wood; and after the excavation of the Severn Valley Railway between Stourport and Bewdley, in 1860, the next year the array of *Papaver Rhæas* all along the line between the two towns was something wonderful to behold. Yet the spreading out of the produce of but a few plants of the *Campanula* and the *Papaver* would be sufficient to account for these extraordinary displays. In general I have noticed that railway cuttings have shown in the succeeding year a great increase in the size and luxuriance



of the common plants of the district, but nothing has occurred fairly referable to the theory of long-buried seeds.

Sir William Guise, Bart., has mentioned a case in the Phytologist, where, after a wood of beech on the Cotswolde Hills, at Birdlip, had been cut down, it was succeeded by a growth of Sycamore trees. But it would be absurd to suppose that these young Sycamores had sprung from buried seeds. They had been wafted doubtless from living trees not far off, and advantage was taken of the space thus vacated by the destruction of the Beeches. The Sycamore is a tree having winged seeds, and if permitted would soon form naturalized groves all over England. I have indeed myself observed the Sycamore as an epiphyte upon old Willows, as well as forming dwarf bushes on the banks of the Severn and Laughern brook.

At Hawford, near Worcester, I once saw a pasture on the margin of the red marl cliff there, covered with a crop of self-sown young Sycamores, and if the field had been kept free from pasturage, here would have arisen a naturalized grove of that tree.

I have noticed within the last thirty years, in our Worcester-shire woods, as well as in those of Herefordshire, a great increase in the quantity of wild Cherry-trees (*Prunus Avium*), and this especially after a fall of the indigenous coppice. This is quite an addition of modern times, for in old undisturbed woods the Cherry is scarcely to be found. Doubtless birds had dropt the stones from fruit they had gathered in orchards, which had thus sprung into vitality on the earliest opportunity.

*Medicago maculata* is rather an uncommon plant in Worcester-shire, but has lately shown itself in some abundance upon a grass path in a hop-yard cultivated by Mr. Smith, of Wick, near the Severn, but whether natural there, or accidentally introduced, is uncertain.

Several other plants have certainly greatly increased and spread, in modern times, whether truly endemic or not, and make a more considerable feature in the vegetation than in

ancient times. such is the Soapwort (*Saponaria officinalis*), now abundant in many places on the banks of the Severn, and the tall specious Tansy (*Tanacetum vulgare*), whose yellow discs are exceedingly abundant on the banks of the Severn in the present day. On the banks of the railway between Droitwich and Defford the Parsnip (*Pastinaca sativa*) has appeared at various points in great force; and the Rosebay Willow Herb (*Epilobium angustifolium*), has also shown a disposition to spread, though known as truly wild in but few places in the county. The common Star of Bethlehem (*Ornithogalum umbellatum*) may be considered a vagrant plant of uncertain location, appearing occasionally in places where it was before unknown (perhaps from bulbs accidentally disseminated), but not often able to establish a permanent dwelling-place.

## NATURALIZED AND INTRODUCED PLANTS.

In the present day naturalized and introduced plants are commonly placed in Floras to rank with truly indigenous natives. To some extent this cannot be avoided, unless the introduced plants are to be considered "aliens," as having, like the *Anacharis*, been certainly noted as trespassers within the last half or quarter of a century. If we go further back, then it is certain that many plants have been introduced by the agency of man that now are so naturalized as to pass muster as natives. Possibly all the presumed "native" plants of Britain are derivative from other quarters, and the speculation has been hazarded from whence they came. To go into the geological question of what plants may have grown in our island under other circumstances "countless ages ago," is perhaps beyond the bounds of botanical observation. But still, exact discrimination requires that there should be some mark by which the true endemic vegetation of a district may be understood, and some time fixed, subsequent to which date any plant appearing, though "apparently wild," should be deemed as of foreign origin.

Prior to the first publication of Herbals, nothing perhaps can be set down with absolute certainty, and with very few exceptions, all plants recorded by the early "simplers" who printed their observations have passed as undisputed natives, until geographical botanists began to discuss the subject critically. But some plant, shrub, or tree, either accidentally or intentionally, has followed the immigration of every tribe of people—in some cases perhaps, even family or individual,—and thus of necessity passing beyond historical observation, we are drifted into the regions of conjecture.

If no limit of time be fixed as to when plants may have been introduced into our Flora, the subject becomes a good deal one of guess, and tortured by rival opinions. There can be hardly any absolute certainty on the matter, except as to weeds of corn cultivation before the Roman invasion. But plants now found growing in places that can have been little altered or not altered at all from their original natural conditions, may well be esteemed as showing now a vegetation that has existed there more or less the same for many centuries. Mountains, heaths, woods, the banks of brooks and rivers, more especially if unnavigable, bogs, morasses, and sequestered ponds, may be in general appealed to as faithful interpreters of indigenous vegetation. Nor is this invalidated because some favourite plants may have been transplanted from such stations into rustic gardens. The sweet Violet, the common Daffodil, and the Columbine, have all in turn had daggers and doubts thrown upon their true nativity, yet all are abundantly distributed in places where only Nature could have placed them, and though perhaps poets are not the best botanists in general, or to be entirely trusted in the question of the indigenous vegetation of a country, yet we may accept what Clare, the Northamptonshire poet, says as to the Columbine—

"Each cottage garden's fond adopted child,  
Though heaths still claim them, where they yet grow wild."

So with many others that have met with rustic approval for

transplantation. Doubtless the *Sedum album*, found growing ever so luxuriantly upon roofs and walls, is a transplantation of man's contrivance originally; but that does not invalidate the fact of the same *Sedum album* growing naturally as it does on the rocks at Great Malvern, though quite in a dwarf and turgid state. The altitude is about 700 feet, on very precipitous rocks not easily got upon, and curiously enough this species of *Sedum* nowhere appears on walls about the bases of the hills. Yet Mr. Watson, who very likely never visited the locality to form a judgment, puts it down among his "aliens," and even De Candolle considers it as naturalized, which no doubt it is on all its *mural* stations. I have seen it on the rocks around Biebrich, Germany, and abundantly in Switzerland, where no one would doubt its nativity, and there can be no valid ground for making it an "alien" here, under the circumstances in which it grows on the Malvern rocks.

The difference of mere opinion, when not influenced by observation of stations, is shown by the list that Mr. Watson gives of more than 300 supposed introduced species into the Flora of Great Britain, out of which only 30 being *queried* as native; Mr. Watson considers as Aliens (180), Colonists (54), or Denizens (60); while De Candolle (*Geographie Botanique*), not deciding on 92, gives 47 as native, or probably so, naturalized 83, and introduced 100. The terms *naturalized* (that is, now growing unaided), and *introduced*, as belonging actually to the agency of man, seems better than "colonist" and "denizen."

On looking over the list adverted to, I find *Helleborus viridis*, *Berberis vulgaris*, *Isatis tinctoria*, *Hesperis matronalis*, *Tilia parvifolia*, *Melilotus officinalis*, *Fragaria elatior*, *Ribes nigrum*, *Sedum album*, *Myrrhis odorata*, *Sambucus Ebulus*, *Lonicera Xylosteum*, *Fedia dentata*, *Campanula Rapunculus*, *Vinca minor*, *Verbascum virgatum*, *Antirrhinum Orontium*, *Lycopsis arvensis*, *Daphne Mezereum*, *Humulus Lupulus*,\* *Populus nigra*, *Galanthus*

\* It was remarkable to observe in 1862, that while the cultivated Hops were a general failure, the *bur* of the wild ones in hedges and thickets was most luxuriantly developed.

*nivalis*, and *Tulipa sylvestris* included ; though all these Worcestershire plants grow in such localities or stations apparently of Nature's appointing, that no collecting botanist gathering them would feel a doubt as to their true position as members of a native Flora.

Where a plant like the Larkspur (*Delphinium consolida*), *Eranthis hyemalis*, or *Corydalis lutea* appears, even apparently "naturalized" for a few seasons, more or less, and not remote from dwellings, it may be safely inferred that they are of garden origin. But it is a very different matter to put down an established plant like *Isatis tinctoria* as an "alien," on mere guesswork, or because it is only known in a few places, and in opposition to historical statements. I have gathered the *Isatis* on rocky banks of the Rhine, and if also in similar places on the Severn, why should it be less wild there? On the precipitous and lofty marl bank of the Severn, at "The Mythe," near Tewkesbury, this plant is in considerable force, and grows most luxuriantly. For almost half a century I have here noticed it as a *permanent occupant*, and as scarcely anything else grows on the bare marl cliff, I consider it a relic of the Flora visible in Celtic times. True the plant itself was cultivated up to the time of Queen Elizabeth, and perhaps later, for dyeing purposes, but I do not know that such was the case near this marl cliff. As, however, its use is traceable up to Celtic times, if introduced at all, it may be fairly supposed to have got on this cliff at a very early date.

The Wall-flower (*Cheiranthus Cheiri*), so common in gardens, and never maintaining itself long together, except in the south, may well submit to be characterized as of foreign origin ; but this could not be so certainly stated of *Hesperis matronalis*, or *Onopordum Acanthium*, though the latter are not without suspicion.

Among forest trees, the Sycamore (*Acer Pseudo-platanus*) has been planted in modern times without any doubt, yet it now shows a decided disposition to naturalize itself, and its keys

blown upon old willows sometimes appear as epiphytes there, or even on roughish portions of the banks of the Severn.

Within this county the Beech (*Fagus sylvatica*) can scarcely be said to appear except in plantations, and I should be dubious of its nativity in the midland counties; but of that of the Small-leaved Lime-tree (*Tilia parvifolia*), there can be no rational doubt, as it exists in so many woods between the Malvern Hills and Wyre Forest, and especially in Shrawley Wood, eight miles north of Worcester, where in one part the underwood consists entirely of the Small-leaved Lime. What is called the large-leaved, though it should be the *large-flowered* Lime (*T. grandifolia* or *grandiflora*), is beyond all doubt an introduction, and has been planted as well about Ombersley and Bewdley as at Little Malvern. But *Tilia parvifolia* not only exists in many woods, but by brook sides, and grows on the rough rock of Rosebury, near Knightsford Bridge, amidst the coppice that has been there time out of mind. The common Crab (*Pyrus malus*) may be found in every wood and coppice flowering and fruiting, though the same cannot be said of the Pear (*P. communis*), which is rarely seen in woods except in a barren state.

As marking the difference between a truly naturalized and an introduced tree of very modern times, the Sycamore and the Larch may be well contrasted, the former often springing up from wind-blown seeds, but not so the latter, unless very rarely. Mr. Watson has said, that—"Strictly, no species ought to be deemed naturalized, unless it maintains its ground here by seeds or other usual mode of multiplication, and *unaided by human agency*."\* But I should strike out the last clause, as all the weeds of Agriculture, though truly naturalized, are more or less assisted in their dispersion by human agency, and would many of them disappear without it. The Poppies and Fumitories would soon be lost in the absence of cultivation, and such plants as the Dodders of Flax and Trefoil only continue with the culti-

\* Cyb. Brit. iv., p. 67.

vation of the plants on which they feed. Even the common Nettle is certainly assisted in its progress by human agency in some mysterious way. The same thing may really be said of the old-established Druidical Mistletoe (*Viscum album*), which, whether it originally appeared on the Oak or the Apple-tree, could not have found a domicile before those trees became denizens of our island, however long ago that may have been.

Agragrians, or Corn-field Plants, must generally be considered as having been introduced originally with corn, and even now they are dependant upon the state of the seed employed, whether foul or with little intermixture of weeds among it. Thus, in Wales, wheat or barley will be found half choaked with a crop of brilliant *Chrysanthemum segetum*, contesting possession of the ground with the crop of corn. The Corn Cockle (*Agrostemma Githago*) is never found out of a corn-field, and is seldom seen in any great plenty, so there can be no doubt of its introduction into our island with corn. Contrasted with the Cockle, the scarlet Pimpernel (*Anagallis arvensis*), abundant as it is, and now capable of maintaining itself on fallow as well as cultivated ground, might seem to be "truly indigenous," yet it is not much to be met with in the truly wild wastes of nature, and is scarcely more permanent than the undoubted recent introduction, *Veronica Buxbaumii*, now so abundant in many fallow fields. The only occasional appearance of *Camelina sativa* points it out as attendant on cultivation, and the same must be said of *Linaria Elatine* and *spuria*. Where plants have been cultivated as crops, and clung more or less tenaciously to the soil afterwards, as *Medicago sativa* and *Linum usitatissimum*, it can only be a question of time as to how long they may have continued under cultivation. Probably *Onobrychis sativa*, though now growing abundantly among limestone in various spots, and quite naturalized, is only a descendant from a cultivated progenitor.

Man and Nature combine in the dissemination of plants adapted to cosmopolitan habits, for as *Willdenow* has remarked—"The wars in which different nations have been engaged,

their migrations and crusades, the travels of different merchants, and commerce itself, have brought a number of plants to us, and transplanted ours to foreign countries." This cause still proceeds, and thus it is that America and Australia have in the present day been annoyed by the inroads of numbers of European weeds. Mr. Bunbury, in noticing the vegetation of part of South America, says, that about Buenos Ayres, European plants accidentally introduced, have spread so rapidly as "actually to predominate over the native growth," and thus give to the vegetation of the country quite an European aspect. Common Fennel, Sowthistle, and *Chenopodium album* quite cover the ground there, and the most common grasses are now *Lolium perenne* and *multiflorum*, *Hordeum murinum*, and *H. pratense*. The "Thistleries" of the Pampas, which extend for many leagues, are well known, and these consist of two European species, *Carduus Marianus* and *Cynara Cardunculus*. So in this country, the foreign clover *Trifolium incarnatum* may now be met with growing by road sides, and will probably extend itself every year, like other introductions.

Decided garden plants, known to have been removed from gardens, however numerous now, can have no claim to be noted except as plants naturalized by the hand of man. Such are *Sempervivum tectorum* and *Linaria Cymbalaria*. Yet the latter, though originally brought from Italy, now spreads by natural means, and has penetrated into the wildest parts of England and Wales; while the House-leek only submits to be tamed and attached to the household like a dog, never attempting independent existence in this country.

## PLANTS OF EARLY INTRODUCTION TO ENGLAND.

Many of our present widely-dispersed plants suggest a suspicion of ancient introduction, and this idea might be worked into a long and curious paper, but I can here only suggest the



subject. Probably every invasion of this island has been the means of introducing plants into our Flora. The first colony of Celts that brought Wheat and Barley with them, must have brought a retinue of weeds in their train. When they sowed their seed corn, Poppies and other "furrow weeds" sprung up with it, and about their rude huts the Nettle, the Plantain, the Wormwood, and various Goosefoots would run riot as they do on waste ground now, or wherever man penetrates. With the Romans certainly came the Roman Nettle, still lurking about old stations, and probably the common Elm, the Cherry, the Chestnut, and the Box. Perhaps also, *Verbena officinalis*, *Centranthus ruber*, and *Chrysanthemum segetum*. It is likely that the Saxons introduced some plants in their train, as the Elder, much venerated in Germany, and we may owe the House-leek to their superstitious ideas. *Smyrnium olusatrum*, generally found in the vicinity of old settlements, and once used as a pot-herb, with *Brassica oleracea*, may be due to them. They probably also extended the plantation of the Beech, for the sake of the mast that fattened their herds of swine. The Normans, when settled down in their new country, introduced better Apples and Pears than were known before, and some of their Ecclesiastics very likely introduced Horse Radish (*Armoracia rusticana*), and perhaps Gout Weed (*Ægopodium Podagraria*), which has the suspicious aspect of a colonist, and some other plants. *Sambucus Ebulus* as "Danewort," was in some way connected with the Danes, and seems to have followed their steps, if Worsae is to be relied on. Then there were colonies of Flemings who settled in South Wales, and their descendants still show a partiality for *Diplotaxis tenuifolia*, which is very abundant about Tenby, where they lived.

The monasteries and nunneries formerly established in Britain, had all their gardens, which nourished flowers that afterwards more or less established themselves in various parts of the country, and to their floral partialities, fancies, and dedication of flowers to saints, we may possibly owe most of the following:—

Adonis autumnalis	Centaurea solstitialis
Delphinium Consolida	Gnaphalium margaritaceum
Chelidonium majus	Senecio squalidus
Armoracia rusticana	Doronicum Pardalianches
Barbarea præcox	Anthemis nobilis (Chamomile)
Cheiranthus Cheiri	Campanula rapunculus
Dianthus Caryophyllus	Atropa Belladonna
Hesperis matronalis	Salvia pratensis
Saponaria officinalis	Mentha viridis
Erodium moschatum	Leonurus Cardiaca
Geranium phæum	Anchusa sempervirens
Sedum reflexum	Atriplex hortensis
Astrantia major	Rumex alpinus and scutatus
Petroselinum sativum	Euphorbia Lathyrus
Carum Carui	Crocus vernus and sativus
Fæniculum vulgare	Narcissus poeticus
Myrrhis odorata	Polygonatum multiflorum
Coriandrum sativum	Galanthus nivalis
Tragopogon porrifolius	Ornithogalum nutans
Carduus Marianus (Holy Thistle)	

If this be considered a long list of plants to have been in monastic gardens, little doubt can exist of their introduction to this country either in monastic times, or subsequent thereto.

A few plants may have been introduced by medical practitioners or wandering quacks, in times when herbs were deemed of greater power than in the present day, and perhaps *Helleborus fœtidus*, as well as *Artemisia Absinthium* and *Aristolochium Clematidis*, may have been thus introduced. So *Papaver somniferum* has probably appeared, and perhaps *Hyoscyamus niger*,\* or even *Ægopodium Podagraria*. It is asserted by Sprengel that the Thorn-apple (*Datura Stramonium*) was propagated by quacks, who carried it about and made some medicine from it. The list might be augmented if reference be made to the pages of Herbals, where the powers and virtues of so many plants are insisted on.

The "domestic plants" that form the rubbishy vegetation about a yard or homestead may well be considered as very early interlopers, or are open to the suspicion of being so, such as *Urtica urens*, *Solanum nigrum*, *Chenopodium Bonus-Henricus*, and others of that perplexing family, *Matricaria Chamomilla*, *Ballota*

\* The Henbane flourishes with peculiar luxuriance in ruinous places deserted by man, or in manured soil. The Club found some noble specimens on the mounds of Elmley Castle, on Bredon Hill, in August, 1866.

*nigrum*, *Verbena officinalis*, and some of the Docks (*Rumex*). Other familiar plants may have followed the march of civilization, and some that might scarcely have been suspected, had they not affected the vicinity of cultivation, or apparently revelled on its borders. The following may confidently be placed in such a list :—

Capsella Bursa-pastoris	Senecio vulgaris
Sisymbrium Sophia	Centaurea Cyanus
S. thalianum	Specularia hybrida
Erysimum Alliaria	Ligustrum vulgare
Lepidium campestre	Vinca major
Sinapis nigra and arvensis	Borago officinalis
Viola tricolor	Lycopsis arvensis
Lychnis diurna and vespertina	Antirrhinum majus
Stellaria media	Melissa officinalis
Trifolium medium	Leonurus Cardiac
Vicia sativa	Marrubium vulgare
Scandix Pecten	Mercurialis annua
Carlina vulgaris	Euphorbia Helioscopia
Tanacetum vulgare	

Everywhere dispersed as the *Plantago major* now is in England, seeing how it follows the footsteps of man and marks the paths of human beings, it may very possibly be only a very ancient immigrant, and is assuredly a cosmopolitan traveller. It is seen skirting every road in Switzerland, on even to the edge of perpetual snow, and found its way to North America with the first colonists that established themselves there, and became known to the Indians as “Englishman’s Foot.”

At the present time among timber trees, the Elm (*Ulmus campestris*) is in hedgerows the commonest tree in Worcestershire, and extends itself by its roots wherever once planted, new stolons rising after the primary bole has been felled. Yet, though now so general in the Midland Counties, no doubt can exist as to its original introduction, though whether in Roman or Crusading times, may be somewhat doubtful. The Elder (*Sambucus nigra*) too, from its almost constant location about dwellings or in churchyards, and very seldom within woods, may well be considered an early introduction, going back to Saxon, if not Roman times. It commonly lines hedges in Italy at present, and Fenton, in his History of Pembrokeshire,

suggests that from its abundance near places of Roman occupation, that it was most probably introduced into South Wales by the Roman invaders of that country. Several fruit-bearing trees and shrubs that have usually passed muster as true natives, more correctly fall into the rank of ancient immigrants; for, if Lucullus brought the Cherry-tree from the East into Italy, it must have appeared in England after that date, although at present fully established in most of our woods. The Red Currant (*Ribes rubrum*) scarcely ever appears, except in suspicious places, where it has been casually thrown, or where birds must have planted it on Limes or other trees, or frequently on old alder boles, where it has been washed along the course of brooks. I should therefore consider it to be an old introduction, for, if really indigenous, there seems no reason why it should have apparently decreased in wild localities. *Ribes nigrum*, on the other hand, is found in spots by the Severn, with better claims to indigenous consideration. The Gooseberry (*Ribes grossularia*) rarely occurs in Worcestershire, or I should say even in England, in what may be considered a locality where no doubt could exist of its being in true position as a native, though it is not uncommon as an epiphyte about gardens. I once, indeed, found it on Craig Brithen, in Montgomeryshire, which might seem a wild location enough, but Larch plantations pointed out the disturbing hand of man, or even there it may have been carried by birds.

#### MODERN IMMIGRANTS & GARDEN STRAGGLERS.

Instructed by the invasion and spread of the Canadian Water-weed (*Udora Canadensis*), within the last twenty years, we see how possible it is for a foreign plant to put on an aspect truly indigenous, by its advance into unfrequented places, where it has got in an unaccountable way. Such immigrations must be marked by the botanist, for though few plants may increase with the rapidity of the *Udora*, or as now more generally known

by Professor Babington's name of *Anacharis alsinastrum*, yet by degrees changes will arise in the appearance of the wild vegetation of a place by the struggle among plants to extend themselves, and the success that some have over others. *Veronica Buxbaumii* now often occupies fallow fields to a great extent, constantly on the increase; and *Ribes sanguineum* is not satisfied to stay in the garden where it has been planted, but as I have noticed both at Malvern, and in the neighbourhood of Bromsgrove, fixes itself, by blown or dropt seeds, upon the walls and hedges of the vicinity where it had been placed, and thus will eventually claim a place in the Flora of England. This may have formerly happened with other plants first placed in gardens, and afterwards either escaping from them, or remaining on the ground after its abandonment for garden purposes. It may be therefore instructive to give a list of such plants as have been noticed formerly in Worcestershire, or within present observation, growing in a half-naturalized state, persistent more or less at one or two spots, though having their origin from modern introduction some way or other. Some of these may possibly obtain a more enduring footing.

## PLANTS NOT TRULY NATIVE, INTRODUCED DESIGNEDLY OR FURTIVELY.

*Eranthis hyemalis*, planted in shrubberies, and sometimes increasing in such places.

*Anemone appennina*, Tunnel Hill, Upton-on-Severn. Rev. W. S. Symonds.

*Delphinium consolida* arable, fields on Bromsgrove Lickey formerly; now seen on waste ground at Cracombe, Malvern, &c.

*Epimedium alpinum*, in shrubberies near Tewkesbury.

*Nymphaea alba*, planted in pools at Glasshampton, Little Malvern, Elmley Castle, &c., but not truly native to Worcestershire.

*Papaver somniferum*, shore of the Severn at Worcester.

*Glaucium luteum*, once found on liassic debris at Shipston-on-Stour.

*Corydalis solida*, woods at Abberley in Dr. Withering's time.

— *lutea*, on walls at Abberley, and near Worcester; persistent.

*Cheiranthus Cheiri*, walls at Worcester, Evesham, Halesowen Abbey, &c.

*Barbarea præcox*, about Welland, Broadheath, and near Worcester.

*Brassica Napus*, on the banks of the Avon, from seeds taken to the Oil Mills.

Rev. A. Winnington Ingram.

- Koniga maritima*, Severn shore at Worcester, and near Malvern.  
*Allyssum calycinum*, railway embankment at Astwood, near Worcester. Mr. T. Baxter.
- Iberis amara*, about Malvern here and there, sparingly.  
*Lepidium sativum*, various places near houses or cultivated spots.  
*Lepidium Draba*, appearing on a newly-raised embankment at Powick, and continuing many years.
- Reseda suffruticulosa*, waste ground, Britannia Square, Worcester.  
*Dianthus barbatus*, copse at Malvern Wells, a garden outcast.  
*Dianthus prolifer*, in a marl pit at Hanley Castle. Mr. Ballard, in Withering.  
*Tilia grandifolia*, planted near Bewdley, Hawford, and Little Malvern.  
*Hypericum calycinum*, shrubbery at Little Malvern, for some years.  
*Acer pseudo-platanus*, established in many places from plantations and wafted seeds.
- Geranium nodosum*, Severn Esplanade, after the new walk was made.  
*Linum usitatissimum*, appearing in various spots now and then.  
*Medicago sativa*, established in several places from former cultivation.  
*Melilotus arvensis*, in arable ground near Wolverley.  
*Trifolium incarnatum*, by road sides here and there, very recently.  
*Lathyrus latifolius*, Severn Stoke Woods. The late Dr. Stokes, in Withering.  
*Coronilla varia*. Naturalized on the banks of the Severn above Bewdley.  
*Spiraea salicifolia*, established on the banks of Dowles Brook, north of Bewdley, but probably planted there.
- Rosa cinnamomea*, in hedges at Claines.  
*Oenothera biennis*, by the Teme side at Powick. Mentioned by Purton as appearing on the banks of the Arrow, after the river had been deepened, on the mud thrown out.
- Sedum reflexum*, on sandstone rocks at Shrawley, and other places; persistent.  
*Sedum rupestre*, planted on walls in numerous spots, and spreading about.  
 ——— album, on roofs at Shelsley, Evesham, &c.  
*Sempervivum tectorum*, planted generally about cottages on roofs.  
 ——— montanum, established for half a century or more on an old wall in Frog Lane, Worcester, but unknown when placed there.
- Ribes sanguineum*, appearing on newly-built thick syenitic walls at Malvern, and in hedges near Bromsgrove.
- Ribes alpinum*, at Northfield, and in hedges at Halesowen; abiding.  
*Saxifraga umbrosa*, on Abberley Hill in considerable quantity, flourishing after being (no doubt) thrown from a garden.
- Astrantia major*, "between Whitborne and Malvern." Mr. Babington, from the late Mr. Borrer's information; but the spot is unknown to any Worcestershire botanist.
- Petresolinum sativum* (Parsley), appearing often on various garden walls.  
*Carum Carui*, in fields near the bridge at Powick. Mr. T. Westcombe.  
*Fœniculum officinale* (Fennel), under the Keuper Marl Cliff at Crowle; also at Powick, in an arable field. Mr. G. Reece.
- Archangelica officinalis*, Severn meadows. In Herb. of Worcestershire Natural History Society.
- Anthriscum cerefolium*, side of the Bath Road, near Worcester; persistent for many years. Recorded by Dr. Stokes long ago. Near Bransford Bridge. Mr. T. Westcombe.
- Lonicera caprifolium*, near Kempsey Grove.  
*Lonicera tatarica*, established in hedges in several places from original planting.  
*Centranthus ruber*, on walls at Worcester, Evesham, &c.  
*Antennaria margaritacea*, Wyre Forest, in one spot only. Mr. G. Jordan.  
*Senecio squalidus*, on old walls at Priory Ferry, Worcester, for many years.

### XXX.

- Aster Novæ-belgiæ*, near the reservoir at Diglis. Mr. T. Westcombe.  
*Centaurea solstitialis*, on waste ground at Malvern. Miss Dyson.  
*Silybum Marianum* (Holy Thistle), near Worcester and other places, but fugitive.  
*Calendula arvensis*, in arable ground and dung heaps, cast out from gardens.  
*Campanula rapunculoides*, at Hadsor, within a copse. "Between Churchill Station and Clent." Mr. A. Irvine.  
*Campanula Speculum*, in arable fields on Bredon Hill. Specimen from Miss Woodward.  
*Syringa vulgaris*, remaining in hedges of forsaken gardens.  
*Vinca major*, in various places well established, but mostly traceable to gardens.  
*Nicotiana rustica* (Tobacco,) has occurred about Bewdley, where it was once cultivated. Mr. G. Jordan.  
*Polemonium cæruleum*, near Bromsgrove.  
*Borago officinalis*, near Worcester, numerous in a coppice by the road side.  
*Anchusa sempervirens*, Mathon, near the Lodge.  
*Atropa Belladonna*, an old occupant at Dudley, and still persistent.  
*Datura Stramonium*, on dung heaps, though rarely.  
*Leonurus Cardiaca*, near Bewdley. Mr. G. Jordan. —  
*Stachys lanata*, near Abberley and Throckmorton. Mr. T. Westcombe.  
*Salvia officinalis*, in a ravine on the old Storage, but not far from cottages.  
*Antirrhinum majus*, walls of Worcester, Evesham, Leigh, &c.; continuing.  
*Linaria Cymbalaria*, on walls in numerous places; plentiful.  
*Linaria repens* or *Italica*, road side near the Mitre Oak. Mr. T. Westcombe.  
*Mimulus luteus*. Once gathered, but the memorandum of the spot mislaid.  
*Veronica spicata*, near the Severn above Worcester (1852). Mr. T. W. Gissing. Not a native of Worcestershire.  
*Veronica Buxbaumii*, become very abundant in fallow fields, hop-yards, &c.  
*Melissa officinalis*. Sometimes near gardens, persistent for a longer or shorter time.  
*Chenopodium Botrys*, "comes up every year spontaneously (as I was told when the plant was shown me,) in the gardens of Lord Lyttelton, Hagley." Irvine, in "Handbook of British Plants."  
*Atriplex hortensis*, on the railway embankment at Shrub Hill, Worcester; plentiful for two years.  
*Beta maritima*, in the same place; abundant at the time.  
*Fagopyrum esculentum* (Buckwheat), at intervals in the Severn district; also at Cradley. Rev. J. H. Thompson.  
*Aristolochia Clematitis*, on the site of old gardens at Worcester and Chad-desley Corbett, some years ago.  
*Buxus sempervirens*, planted in woods on Bredon Hill.  
*Euphorbia Lathyris* (Caper Spurge), Crow's Nest, and other places where gardens have once been.  
*Ulmus campestris*, abundant in hedges, and still increasing from the roots after the primary bole has been felled, and thus abiding.  
*U. suberosa* and *carpinifolia*, both planted in a few places.  
*Ulmus glabra*, in Crow's Nest Wood. Mr. T. Westcombe.  
*Salix vitellina* (Golden Willow), frequent in or close to cottage gardens.  
 — pentandra, planted at Frankley. Not native to the county.  
*Fagus sylvatica*, planted at Frankley, on Bredon Hill, &c.  
*Castanea vulgaris*, in Shrawley Wood, and planted also in Birchin Grove, &c.  
*Carpinus Betulus*, planted in shrubberies. None in woods.  
*Anacharis Alsinastrum*, in the river Avon, and in pools and water courses both on the east and west sides of the Severn.

*Iris Xiphoides*, by the Avon side at Fladbury. The late Dr. Stokes.  
*Crocus vernus*, near Worcester at times, but in proximity to occupied ground or old habitations.  
*Crocus sativus*, growing formerly at Kyre Wyard, according to Dr. Nash, in History of Worcestershire.  
*Narcissus biflorus*, in orchards near Kempsey, Sapey, &c., but not long persistent.  
*Narcissus poeticus*, at Crow's Nest, on the site of a former garden.  
*N. incomparabilis*, reported by Mr. Roby, at Malvern, but under what circumstances not stated.  
*Asparagus officinalis*, on rough walls at Great Malvern; recently.  
*Polygonatum multiflorum*, near Clifton-on-Teme, in one spot.  
*Tulipa sylvestris*, a recent immigrant on Pitchcroft, Worcester.  
*Ornithogalum umbellatum*, near Kempsey Grove and Broadheath, &c.  
*O. pyrenaicum*, near Cotheridge Court, on old authority.  
*O. nutans*, at Bromsberrow. Rev. R. P. Hill.  
*Setaria viridis*, arable fields at Henwick, &c., soon disappearing.  
*Phalaris Canariensis*, occasionally occurring, but not abiding anywhere.  
*Lolium Italicum*, borders of fields, from cultivation.  
*Lolium multiflorum*, near Powick. Mr. T. Westcombe.

It may be useful to record the above as certainly all introduced plants, whether purposely or accidentally, and many of which are now so established as to put on the appearance of true nativity to any observer not acquainted with their history, such as *Onobrychis sativa*,\* or *Sedum reflexum*, of very old date, and *Anacharis Alsinastrum*, the newest. Probably others in the list will more or less establish themselves, as seasons and circumstances become favourable to their spreading. A vegetable appearance, though the work of an insect, deserves to be here mentioned, on account of its rapid increase during the last ten or twelve years. This is the bullet gall-nut of the Oak, caused by the attack of the *Cynips quercus-petiolis*. Twenty years ago it was either entirely unknown in England, or of very rare occurrence; while at present it abounds in almost every oak coppice, and I have seen it in Mr. R. Smith's nurseries at Wick, near Worcester, in clusters, actually overpowering and weighing down scores of young seedling oaks by its oppressive numbers.

\* The Saintfoin has now such an appearance of nativity and permanency on Bredon Hill, at Martley, Mathon, &c., that I should have felt inclined to consider it truly indigenous, had I not met with the following account, which gives the date of its introduction into Worcestershire. In a letter by Mr. Penyston Hastings, an antiquary of Daylesford, to Dr. Thomas, of Worcester, dated Dec. 11, 1732, he states, that "at this place (Daylesford) was first introduced the cultivation of Saintfoin, a French grass brought into England by John Hastings in 1650."



## PLANTS BECOMING RARE OR EXTINCT.

With the above list of immigrants or intruders, may be contrasted those plants that, from drainage or other causes, are either disappearing, or within the last few years have become quite extinct. The following may be enumerated as becoming very rare, or not at present to be found in this county, where they formerly flourished :—

Myosurus minimus	Lactuca Scariola
Ranunculus Lingua	Wahlenbergia hederacea
Berberis vulgaris	Vaccinium Oxycoccus
Viola palustris	Pyrola minor
Drosera rotundifolia	Menyanthes trifoliata
Parnassia palustris	Pedicularis palustris
Dianthus deltoides	Marrubium vulgare
Hypericum elodes	Pinguicula vulgaris
Geranium pyrenaicum	Hottonia palustris
Erodium maritimum	Anagallis tenella
Rhamnus Frangula	Samolus Valerandi
Genista anglica	Polygonum minus
Astragalus hypoglottis	Euphorbia platyphylla
Spiræa Filipendula	Populus nigra
Comarum palustre	Juniperus communis
Rosa Sabini	Epipactis palustris
Pyrus domestica	Narthecium ossifragum
Pyrus torminalis	Cladium Mariscus
Lythrum Hyssopifolia	Schœnus nigricans
Ribes nigrum	Rhynchospora alba
Bupleurum tenuissimum	Eriophorum angustifolium and latifolium
Sambucus Ebulus	Carex elongata
Inula Helenium	C. curta
Pulicaria vulgaris	Polypodium Dryopteris
Cnicus pratensis	Osmunda regalis
Arnoseris pusilla	

Many of the above have become very rare, or altogether disappeared from Worcestershire. Especially is this the case with plants partial to bogs and marshes which are drained, or their limits curtailed every succeeding year. Thus *Cladium Mariscus*, *Schœnus nigricans*, and *Hypericum elodes* have altogether disappeared from Worcestershire, and only one locality—a secluded pool at Spetchley—is now known for *Ranunculus Lingua*. Circumstances are unfavourable for the continuance of such trees as *Pyrus torminalis* and *Juniperus communis*, which being of slow growth, when cut down are not

renewed. About the borders of brooks old gnarled stubs of *Populus nigra* are not uncommon, but no young trees of this species now appear, although the Italian variety, when planted, flourishes, and has been extended in all directions. Every year almost sees some heath or waste enclosed, and then the plants that were indigenous there are eradicated, or so lessened that by degrees they die out altogether. Even the Malvern Hills are invaded and cut up, and thus one of the few localities for *Polypodium Dryopteris* has been destroyed. The "bare-worn common is denied" now by the perpetual enclosures going on, as much to the wandering botanist as to the poor cottager. Recently too, hedges have been extensively stubbed up, and coppices cut down, so that the asylum left to several rare indigenous plants has been taken away.

### CONSPICUOUS VEGETATION.

A mere list of orders, genera, and species, such as usually given in a Flora, even when sub-divided into districts, by no means presents to the mind or the eye a notion of the prevailing vegetation anywhere. The statement that *Sedum album*, *Digitalis purpurea*, *Potentilla verna*, and *Corydalis claviculata* grow on the Malvern Hills, or a list of all the plants growing there, by no means gives an adequate notion of the vegetation making up the aspect of the hills; and so with other portions of the county, the woods, the upland meadows, and the banks of rivers. To do this, reference must be made to what Humboldt has called the "physiognomy of vegetation," and then the different parts of a country may be contrasted with each other. Even portions of the same chain of hills may show differences of aspect, according to the plants clothing the ground, and among the Malverns, the appearance of the well-named "Holly-bush Hill," ever robed in the dark verdancy of that spiny-leaved tree, offers a remarkable contrast to the treeless North Hill, invested in summer with a robe of glowing purple, from the numerous Foxgloves that cover it. Later in the year the exposed sides of

the Malvern Hills are refulgent in gold, from an extent of blossoming autumnal Furze (*Ulex Gallii*). The common Brake (*Pteris aquilina*), equally abundant on the slopes of the hills, as autumn approaches combines the burnt sienna of its fading fronds with the dark green of the Furze. Bromsgrove Lickey puts on a different appearance with its stiff bilberry bushes thickly covering the hills and concealing the ground, and this changes when the bilberry wyres\* are reddened by the autumnal sun. Here, too, in August, the *Calluna* and *Erica* empurple the heathy spots still unenclosed.

Bredon Hill, whose sides are broken into rude heaps by the slips of the fractured oölitic stone, and covered with unnumbered Hawthorns, presents a beautiful sight in May and June, when the flowering "milk-white thorn that scents the evening gale" is at its perfection of beauty. Some of our Worcestershire woods are very beautiful with numbers of silvery-barked Birches; while Wyre Forest consists almost entirely of Oak, a few solemn spreading Yew trees being only occasionally interspersed. Other woods, like Shrawley Wood, are mostly made up of Limes (*Tilia*) or Hazels, while the tall Elm trees of the open country, give a character to the extensive hedge-rows of the Vale of Severn.

Hartlebury Common, thick with the wiry Heath (*Calluna* and *Erica*) in one part, or grey with spreading Rein-deer Lichen in another, calls to mind the solemn wastes of Scotia; and some barren hilly limestone pastures produce but a scanty herbage of *Bromus*, or the still more despicable *Brachypodium pinnatum*. Many moist upland fields are gay in April with unnumbered Daffodils and Cowslips, while somewhat later the prevalent deep purple flowers of *Orchis Morio* give them a character. The Severn meadows have always a golden week or two in May from the profusion of the yellow flowers of the acrid Buttercup (*Ranunculus acris*); but pastures vary much in their flowers as the spring advances—first silver with Lady-Smocks or Daisies,

\* The dense stubs of entangled bilberries are locally termed "wyres," and hence perhaps the designation of *Wyre* Forest, where the bilberry must have been abundant.

yellow with Dandelions, and in September purple with the innumerable naked crocus-like blossoms of *Colchicum autumnalis*. The banks of the Severn are quite yellow at one time of the summer with the flowers of *Nasturtium sylvestre*, and at a later period of the year golden with the conspicuous discs of the Tansy. In particular spots masses of wild Roses festoon the hedges with beauty, and I remember a particular neglected spot near Cracombe that used to be exquisitely adorned with numerous flowering bushes of *Rosa Sabini*. Brambles in thickety places like Cowleigh Park, near Malvern, are abundant enough to give a feature to the scenery whether in flower or fruit, when unchecked in their luxuriance.

In April and May, the Apple and Pear Orchards, so abundant in this county, are a sight of beauty, and—

“The red apple red as evening sky,”

delights the eye when the trees are loaded in a favourable year. The flaunting Hops, when they appear dangling from the lofty poles, present an elegant and characteristic appearance in their own way. So varying with the seasons is the physiognomy of the vegetation of the country whether native or cultivated.

The ground in woods may be blue in the early spring either with Dog-violets, or from an exuberant growth of the wild Hyacinth, pallid yellow with abundance of Primroses, or white with Anemonies. *Euphorbia amygdaloides*, which is a gregarious plant, makes a very conspicuous appearance in early spring on woody ground, though only displaying a pale verdancy. Certain woods produce a great quantity of the plants they harbour, as *Campanula latifolia* in Shrawley Wood, and *C. patula* in others; while occasionally Wyre Forest has its glades beautified by hundreds of the Sword-leaved Helleborine (*Epipactis ensifolia*). Even *Iris foetidissima* makes a conspicuous feature on the Berrow Hill, and in Sarn Hill Wood; while in autumn various hills of Silurian as well of Oölitic limestone are made conspicuous with the feathery seedy plumes of *Clematis Vitalba*, almost white as a snow wreath. A mere techincal Flora only shows plants as

common or rare, without distinguishing the changes that Nature shows at various times.

Even in water there may be appearances dependent on circumstances which give a changed aspect to the scene at different times. Thus when the "Severn swift" flowed with its natural current through the county, the shallows about Worcester in summer time were generally resplendent with the white shining crowded flowers of *Ranunculus aquatilis*; but since the river, under the direction of the Severn Navigation Commissioners, has by weirs and locks been raised, so that the waters have an uniform depth of five or six feet, the *Ranunculus* no longer flowers, not being able to reach the surface, though yet existing below the water in an unflowering state. In the shallows near Bewdley its flowers still appear. Sequestered pools are here and there matted over as it were with the leaves of *Hydrocharis morsus ranae*, which when in flower on summer evenings has a very pretty appearance. *Enanthe Phellandrium* sometimes fills little shallow pools with its pipy stalks to repletion, and is then very conspicuous with its silvery flowers. Particular pools and quiet brooks abound with the yellow Water-lily, whose numerous orbs of gold present a splendid appearance in connection with their large floating cordate leaves. On the banks of the river Teme, in particular, and its tributary brooks, the pale purple corymbs of the *Petasites vulgaris* have a peculiar aspect in early spring, and their enormous leaves in summer are still more apparent as a feature of vegetation. So by the Avon and fringing many marshy pools are the long spear-shaped leaves of the great Water-dock (*Rumex Hydrolapathum*), and the dense purple blossoms of *Lythra salicaria*. The tall and dense masses of Bullrushes (*Scirpus lacustris*), are also a feature of the flat margin of the quiet Avon, while around the ditches of Longdon Marsh the Reeds (*Phragmites communis*) rear their culms and purple panicles six or more feet in height. Willows (and especially *Salix alba*), wherever they occur along the margin of streams, make a conspicuous appearance. They shroud the waters of the Teme almost throughout its course in this county;

and by the Avon and numerous winding brooks, their tortuous hollow boles and queer-shaped monstrous overhanging heads make an appearance as often grotesque as it is picturesque.

### OLD FOREST TREES.

Such has been the destruction of timber trees in Worcestershire, that but a very few old trees can be said to exist, though there are many that from premature decay put on the appearance of "dry and bald antiquitie." The chace of Malvern was before the Conquest, as stated by William of Malmesbury, "a wilderness thick set with trees;" but I could not now point to any tree remaining there, that with certainty might be assigned to that period. Generally speaking, the Yew may be considered as offering the best claim to longevity, but though in several churchyards there are Yews doubtless seven or eight hundred years old, none are of extraordinary size. Perhaps the finest of our Worcestershire Yews is that at Stanton, in the southern part of the county. I have also noticed a large and rather extraordinary one at Kyre Wyard, near Tenbury. A battered Yew that stands upon Abberley Hill, having three monstrous arms, must be of great age; but without a section of one of the boles, one could only make a rough guess at the time any of these Yew-trees have maintained their present positions. There is a hollow Yew-tree in the churchyard at Broughton Hackett, about five miles east of Worcester, whose dimensions and history were sent by the rector, the Rev. H. M. Sherwood, to Dr. Lindley, who thought it possible the tree might be one thousand years old. In woods about the Berrow and on the hills of the Silurian system, the Yew is a tree of frequent occurrence. Some fine spreading specimens on Wichbury Hill, near Hagley, add solemnity to that classic ground.

Many of the battered and gnarled "Bur-Oaks" or Pollard Oaks scattered over the country, must have endured many centuries; but the finest old Oak that I know in the county, stands in a field near the Severn, below Holt, and is called

"the Boar (Hoar) Stag Oak." It measures about 34ft. in circumference, at a yard from the base, and may be roughly calculated at 800 years old. There is also a large though not so fine a tree as this in Hartlebury Park; and by the roadside at Hartlebury is the well-known hollow and somewhat burnt "Mitre Oak." This is probably about 600 years old.

Maples (*Acer campestre*), occur here and there of considerable size, and being a long-enduring tree it attains a great age. It is, however, seldom allowed to live unlopped, or the Maple would make a very handsome appearance. A great hollow tree at Powick, I estimated at something near 600 years old; and one almost equally ancient now stands near Hanley Castle, where the renowned Beauchamps Earls of Warwick once held their court.

The Service-tree (*Pyrus torminalis*) must have abounded in the old woods of Worcestershire, for many trees of this species are dispersed about the country. In "My Lord's Wood" at Powick several tall trees as much as 40 ft. in height yet remain, and one in particular a didymous tree has a girth of more than six feet. The Mountain Ash (*P. aucuparia*) is not so plentiful, nor does it grow so tall. It is a native in the woods on the Silurian strata about the Malvern Hills, but rare elsewhere.

The Holly is abundantly distributed about Bromsgrove Lickey and the Malvern Hills, and in both places trees of considerable size and age occur. "The Holly Bush Hill" is so designated from the numerous hollies that grow on its sides.

A magnificent Ash Tree grew near the Hope End, Ledbury, some years ago, but is now cut down. Pollarded Ashes often remain till hollow, distorted, and grub-eaten by the side of brooks, but in other places are cut down when the wood is ripe for use. The names of several places have been derived from Ash trees growing there, but they have been mostly consonanted, and become "The Nash."

The small-leaved Lime (*Tilia parvifolia*), if not *T. Europæa*, appears in many woods and on the banks of brooks in wild



**THE MITRE OAK,**  
*On Hartlebury Common, Worcestershire.*





places as an undoubted native ; but the woods where it appears are mostly confined to the western side of Worcestershire. Old, distorted, and even hollow Limes, apparently ancient, are not uncommon, but to what age they have arrived must be considered uncertain. A monster with six spreading boles (it having been sometime pollarded) stands on the bank of the Severn, near Hawford, more than forty feet in girth round the base, and I have seen some large trees near the Berrow Hill, Martley, and about the base of Abberley Hill. No doubt in the beginning of the last century the *Tilia Europæa* was introduced from the Continent to form avenues, and at Cotheridge Court, four miles west of Worcester, is a double avenue of limes about half-a-mile in length that make a grand appearance. Our associate, Mr. G. Jordan, has remarked upon the Limes in Wyre Forest, and mentions *T. grandifolia* as growing there. Some large trees of this species may be seen at Little Malvern, and in a field near Bromsberrow, but I should say planted in all cases. The tree (or rather two united trees) in a field near Bromsberrow is very remarkable.

The Birch (*Betula alba*) appears in all our woods as a scattered tree, but of no great size. Near Acton Beauchamp, however, I have noted a grove consisting entirely of Birches, and some of them widely branched, and apparently very aged. Some curious old Birches also occur about the base of the Berrow Hill, near Martley, of Nature's own planting.

Hawthorns (*Cratægus Oxyacantha*) generally appear as scattered trees or bushes, especially on the declivities of hills, and as bushes ascend to the tops of the Malvern Hills in places. Some of these thorns must be many centuries old, and I remember a very fine one in front of the old public-house by the Severn at Shrawley, which was nine feet in girth. There is a much branched old Thorn in the grounds of J. W. Willis Bund, Esq., at Upper Wick, mentioned as an old tree in that gentleman's writings, and reputed to be more than 700 years old.

The Wytych Elm (*Ulmus montana*) is very characteristic of the margin of hilly woods, where it attains a considerable size, and being usually lopped, the heads of the trees often swell out into monstrous dissightly proportions. Some grand old trees that have escaped this disfigurement adorn the park at Elmley Castle. The common Elm frequently becomes wenny and disproportionate, and is then conspicuous, appearing older than it really is. There is a large old battered one on Barnard's Green, Malvern.

No tree in the country is more common by brook sides than the Alder or Orl (*Betula Alnus*, Linn.), spreading in a bushy manner in general, though often rising into trees of fifty or sixty feet in height. On the banks of the river Teme, and by Laughern and other brooks, old stumps of Alder, by constant lopping, become very grotesque and swollen, and some of them must be very old. The abundance of this tree in ancient times is shown by the term *wern* (British for alder), which enters into the composition of some proper names—Malvern to wit—which is explained to mean a bald hill rising from among a wood of Alders.

The White Poplar (mostly I believe the form called *Populus canescens*), shows its characteristic silvery foliage in many marshy spots, or by brook sides, and rises up to a considerable altitude, forming clumps visible at some distance. Though growing high, they seldom, however, attain any remarkable bulk. A few scraggy native Black Poplars (*P. nigra*) appear in various localities by brook sides, but this tree appears to be dying out.

The White Willow (*Salix alba*) is abundantly dispersed by the side of all our rivers and brooks, and appears in every form and shape, from a rising seedling to a hollow, distorted, and decrepid tree, not merely "stooping as if to drink," but stooping in the decrepitude of sinking age, and often quite bent to the ground, or bridging over the brooks where it has fallen. Under favourable circumstances it rises to a considerable height, with extending branches, but is generally so much lopped as to induce

ugliness, an over-burdened head, and premature destruction. Few other Willows grow to any great size. The Peach-leaved Willow (*Salix amygdalina*) adorns the sides of many brooks with its characteristic shining verdant foliage.

Pear-trees in orchards often assume a gigantic port, and in time rise as high, if not so bulky or venerable as oaks, and with a very rough bark. But I should not consider any, however apparently hoary, to reach an age much beyond 300 years. The Barland Orchard, near Newland, of 70 trees or more, used to make a splendid appearance some years ago when in blossom, but the trees are now old and evidently past their vigour and beauty.

### CRITICAL PLANTS.

The subject of "critical plants" is a difficult one ; though in a comparison of numbers between one district and another it leads to confusion or uncertainty—as almost every author disagrees, in this respect, with another, and is more or less inconsistent. Much depends upon the genera authors have studied, and thus it is that while a form of *Rubus* is denied distinction by some botanists, we find they readily allow it to a variety of Cudweed. In "splitting up" species great judgment is required, and it should not be done without good cause. At the same time, I think too much scepticism should not prevail the other way ; and where an author has given long study to a particular genus the result of that study should be acknowledged and allowed. I feel disposed generally to allow Mr. Babington's species, and so have followed his arrangement in the tabular list\* ; though in some respects, as with the *Rubi*, which I have long studied, I cannot in all cases agree with him. I have therefore thought it best to place in an Appendix my own arrangement of species of Worcestershire *Rubi*. Long observation and experiment is necessary before every species proposed by authors can be fully adopted ; but, on the other hand, it would

\* Babington's Manual of British Botany, 5th edition.

be very rash to ascribe all the forms of brambles observed to varieties of *R. cæsius* or *R. fruticosus*. No doubt that *Rosa canina* sports into numerous varieties, but that is no reason why *R. tomentosa* should be confounded with it, or *R. spinosissima* be mixed up with *R. Sabini*. Yet, perhaps, *R. rubiginosa* and *R. micrantha* may not be truly distinct from each other; and I have gathered a rose almost exactly intermediate between *R. rubiginosa* and *R. canina*. Still, when the Sweet Briar, even in its wild state, puts on so different an appearance to *R. canina*, it would not be wise to confound them together. In my "Botany of the Malvern Hills" I have described a form of Rose growing near Cradley as *R. glaucophylla* ("hispidæ," Desv. ?), distinguished by its "densely setose fruit and peduncles," as well as its "calyx-segments pinnate, elongated, and clothed with abundant setæ." There were large bushes of this in one locality, and if botany is a science of discrimination, different at first sight as it is from *R. canina*, it merits distinction. Whether naturally any *hybrid* forms of rose might occur is more than I can say, as observation does not assist me.

M. Crepin, in his last edition of the "Manuel de la Flore de Belgique," says that it is a very difficult point to say whether "the *R. canina* of the older authors is an excessively polymorphous type or made up of an association of different species." He then enumerates nine presumed species of the same value in rank as *R. canina*, but only distinguished from that naked-leaved rose by the uncertain characters of a more or less spheroidal fruit, leaves pubescent on the veins below, tomentose, and with pedicels more or less setose. But this variation of hairiness and setosity, often difficult to appreciate, is not to be estimated the same as the constantly villose leaves and setose fruit of *R. tomentosa*, or the setose and prickly stems of *R. spinosissima* and *R. Sabini*. It seems, therefore, the wiser course not to "split up" *R. canina* to the extent proposed by foreign authors; and though Mr. J. G. Baker has recently attempted to reduce or rather increase our British roses—at

least in name—according to the latest continental method, it is scarcely worth while to adopt names that, if applicable individually, will hardly be of permanent continuance. There are particular genera in which Nature undeniably “sports,” as florists say; and it might be expected that a botanist, devoted to the genus, might be tempted to make too great segregation, and there accordingly some little suspicion may be roused; but to reduce *all* the fruticose Rubi to *R. fruticosus*, combine various *Cenantes* into *C. pimpinelloides*; several forms of *Cerastium* into *C. glomeratum*; join *Eriophorum angustifolia* and *latifolia* into one; *Salix cinerea*, &c., into *S. caprea*; *Carex binervis* united with *C. distans*; *C. teretiuscula* with *C. paniculata*; *Epipactis media* and *ovata* combined with *E. latifolia*; and other changes as Mr. Bentham has recently done, must, I think, have the effect of repressing examination, and introducing confusion into all our ideas, without understanding what collectors have meant in past years. At the same time, judicious correction, when necessary, must be employed. Few botanists would agree that *Asplenium viride* and *A. Trichomanes* were the same, *Fumaria capreolata* and *F. officinalis*, *Viola flavicornis* and *V. sylvatica*, or *Myosotis alpestris* and *M. sylvatica*; though it may be admitted that *Centaurea* “*nigrescens*” is a mistake, and that *Myosotis repens* and *palustris* are not sufficiently distinct, and that *Sedum Forsteri* is but a variety of *S. rupestris*. Such corrections may be fairly admitted, when made by experienced observers, without coming to the conclusion that “book species” or plants described in books by characters that apparently distinguish them are to be generally distrusted as conventional and optional. But even Mr. Watson considers that Bentham has “carried the aggregation of species to an extreme.”\* Mr. Babington may, on the other hand (as in the case of *Arctium*), show too decided a tendency to segregation.

We must be reasonable, and exercise sound judgment as far as practicable. For if Professor Babington may have extended

\* Watson, Vol. iv., p. 278.

his list of British *species* too far in making them 1495, so Mr. Bentham has certainly erred too much the other way in reducing the number to 1175—the actual difference between them being 320 species, without reckoning “aliens” and those peculiar to Ireland or the Channel Isles. Mr. Watson in the summary and census in his *Cybele*, has placed the number of plants treated as British species at 1425, “though truly not all of them believed to be such”\* by that very critical and voluminous recorder.

But it is the peculiar office of the botanist to *discriminate*, and not to confound; and this, as Sir J. E. Smith has stated, is the wisest plan to adopt. It is not certainly for the observing local botanist to decide arbitrarily upon distinctions, but to *note* them; and if he does not do this he neglects his work. If I find in an alpine locality a pretty little *Rubus*, with a creeping stem and compound panicles of small crimson flowers, very unlike the “*fruticosus*” of the low country, am I to pass it over unnoticed, and only record it as *the same* as the old familiar plant which it strikes me at once as being so different from? I conceive not, and therefore recognise the “*Rubus Sprengelii*” as distinct and local. Why, too, is a *Campanula* or an *Hypericum* to receive immediate attention, and the *Rubus* or the *Salix* be not considered worth discriminating? Allowing that in this first gathering and arrangement there may be doubtful points to be afterwards adjusted—as whether *Anagallis arvensis* and *cærulea* are certainly distinct—still, by strict discrimination, we shall be less likely to neglect anything worth noticing than if we pass over particular genera under the idea that the forms observed can only be varieties of one typical species.

Particularly, then, in local Floras, when plants are gathered and enumerated, nothing apparently differing from a common known form should be passed over on the supposition that it is a mere variety that need not be cared for. It will, nevertheless, be instructive to mark how a variety may, for a time, be speci-

\* Watson, *Cybele*, iv., p. 278.

fically exalted, and then altogether disappear from the scene. When preparing my "Botany of the Malvern Hills," I gathered what I considered to be a curious bracteated variety of *Carex ovalis*, and sent it to the late Mr. S. Gibson, then studying the tribe, and he called it Var.  $\beta$ . *bractæata*. Afterwards it was elevated by the same acute botanist, in the "Phytologist,"\* to the rank of a new species, as *Carex Malvernensis*; while it was, in subsequent pages, doubtfully considered as *C. argyrolochin*. It finally slipped from view altogether! These changes of opinion, founded on the examination of particular specimens, must always render the described number of plants in a country much investigated very fluctuating. But accidents and natural changes will also have this effect. *Pyrus domestica* having been burned down in 1862, in Wyre Forest, no longer exists for either England or Worcestershire; and many plants have been lost to the county here discoursed upon, either from increasing cultivation and enclosures, or from natural causes which have prevented the continuance of a plant which has only subsisted for a time. When a plant presents an obvious difference at once to the eye of the gatherer, it deserves and ought to be acknowledged; but to divide *Ballota nigra* into two species on such minute differences of studious examination that only a few can determine is puzzling, but by no means advantageous to science. I have, therefore, continued *Ballota nigra* as one, and so also with a few other too "critical" forms. But though *Rosa canina* may have numerous varieties, I cannot admit that it would diverge into *R. mollis* or *tomentosa*, or that there is any difficulty in acknowledging that *R. Sabini* is distinct both from the latter and from *R. spinosissima*.

If in some of the aggregations of presumed species that a profound botanist like Mr. Bentham has made, we may be disposed to agree with him, yet I could myself never consent to aggregate the four species of *Ceanothe* into one, or feel satisfied (to say nothing of *Rubi* or *Salices*) that *Ranunculus hederaceus*

\* Phytol. i., p. 716.



was the same as *R. aquatilis*; *Myosotis cæspitosa* as *palustris*; *Fumaria capreolata* as *F. officinalis*; *Lotus major* as *L. corniculatus*; *Spergularia marina* as *S. rubra*; *Eriophorum latifolium* as *E. angustifolium*; *Lactuca virosa* as *L. scariola*; *Sedum reflexum* as *S. rupestre*; *Myosotis alpestris* and *M. sylvatica* varieties of each other; *Carex rigida* a form of *C. vulgaris*; or *Asplenium viride* as a derivative from *A. Trichomanes*. To do so appears to me to be confounding forms obviously distinct; and in other cases there could be no confidence in any definite descriptions professing to distinguish species from their near relations. There is, besides, the inconvenience of estimating the number of plants in any district according to opinion rather than fact, and striking the average between the discordant views of a Bentham or a Babington.

Mr. Babington has increased his species of *Ranunculus* to a considerable extent in the last edition of his Manual, but in this and some other segregations I have not followed him in my tabular arrangement of Worcestershire plants.

A few other observations only are necessary in illustration of the plants in the four divisions. *Brassica campestris* is only present in Worcestershire, according to my friend Mr. T. Westcombe's judgment, in the form *β. rapa*, the turnip, and this must be doubtfully indigenous.

Some confusion appears to exist as to the species of *Ulex* (Gorse), and I am dubious whether the trailing typical *U. nanus* occurs at all in Worcestershire. The common gorse of the Malvern Hills and Bromsgrove Lickey is the stiff and erect *U. Gallii*, only flowering in autumn; *U. Europæus* grows on lower ground, and its flowering time is in May and June, though stray plants may show their blossom earlier. This last has been often planted and spreads accordingly.

*Potentilla procumbens*.—I have inserted under this name a plant not very uncommon in the Malvern district, and which I have also gathered in several parts of Wales. It has been the subject of much dispute among botanists, being called *Tormen-*

*tilla reptans* by Linnæus and Smith, *Potentilla procumbens* by Sibthorp, and now referred by Professor Babington as a variety of *P. Tormentilla*. Others have considered it as only a form of *Potentilla reptans*, but as it appears to me distinct both from the latter as well as *P. Tormentilla*, I append a description :— Root woody, terminating somewhat abruptly. Stem trailing, round, clothed with appressed hairs, leafy at the joints. Radical leaves on longish stalks, with appressed hairs, quinate, leaflets obovate deeply incised, with a few long scattered hairs above, very hairy on the prominent ribs beneath, their thickened margins ciliated. Stipules lanceolate, entire, hairy. Stem-leaves arising from the joints, either single, in pairs, or in threes, on short stalks, mostly ternate, or with an accessory leaflet either to the terminal or one or both lateral leaflets. Flowers on round axillary hairy peduncles. Sepals 8 or 10, ovate, hairy, acute, the alternate external ones narrower and shorter, all spreading in flower. Petals 4 or 5, round, yellow, with a shallow notch or indent. Receptacle densely hairy. The Malvern plants growing on closely-bitten turf, are much diminished in size, mostly not more than three inches in length, but even in Welch specimens, extending to a foot and a half, I have never observed the stem to root at the joints as in *P. reptans*. In fact the plant here described appears quite different to that, though as far as number is concerned, the petals are as often 5 as 4, and the sepals 10. The radical leaves are quinate, but those of the stem always ternate, or with one accessory leaflet either to the central or one of the lateral leaflets.

*Sium latifolium* has been found by no living botanist within the county, but Purton in his "Midland Flora" declares to have gathered it *himself* at Blakedown Pool, near Stourbridge.

*Enanthe pimpinelloides* shows both in its roots, umbels, and flowering-time that it is decidedly distinct from *Æ. Lachenalii*; and no botanist who observed them growing could think otherwise. The former is very plentiful in some seasons and then disappears for a time; but again recurs near its old locality. It is

not so with *Æ. Lachenalii*, which may generally be found every year.

*Æ. silaifolia* is devoid of the radical wedge-shaped leaves that distinguish *Æ. pimpinelloides*, is but little branched, and having few leaves, has quite a naked appearance. It is devoid of a general involucre, but the partial umbels form dense almost orbicular aggregations, with involucre as long, and sometimes longer than the flowers. Petals silvery-white, deeply notched. Confined to watery meadows.

*Valerianella eriocarpa*, Desv.—This rare plant was inserted in my “Botany of the Malvern Hills” as *Fedia mixta*, under which name it appeared in Hooker’s British Flora. As both Mr. J. T. Syme, in the new edition of English Botany, and Professor Babington, in the 5th edition of his Manual, refer to my authority for its occurrence in the Malvern district, it may be well to here transfer the note I put down at the time I gathered it, when I made a sketch of the fruit, and the exact spot where found :—“*F. mixta*, Vahl. Stem rough, dichotomously branched, the leaves tongue-shaped, middle ones jagged, upper ones pectinate at the base ; flowers light purple, in small terminal corymbs with ciliated bracts at their base. Capsule obscurely tetragonous, compressed below the calyx, inflated and ribbed, clothed with rigid incurved hairs, and crowned with the oblique gaping unequally-toothed calyx.” Locality—“By the side of the road between New Pool and the Hanley turnpike gate, below Malvern Wells. Aug. 29, 1842.” I have not since searched for the plant at the spot named, and elsewhere it has not occurred to my knowledge.

In the genera of *Chenopodium* and *Atriplex* there is possibly room for some additional research, if any member of our club had inclination for the examination of a tribe not particularly inviting. *C. urbicum*, *ficifolium*, and *hybridum*, have only one record each ; and others that perhaps may be found are not noticed at all. *Atriplex Babingtonii*, or *rosea*, grows in some plenty on the banks of the salt-water Droitwich canal ; but

perhaps it is not exactly identical with the plant that is said to be "common" on the sea-shore.

*Rumex palustris*.—I have followed Professor Babington and others in distinguishing this from *R. maritimus*, though they approach very near to each other, and the latter is not especially attached to maritime localities, as I have gathered it by the Chalybeate Pool at Great Malvern. The leaves of *R. palustris* have a remarkable glaucous appearance like those of *Isatis tinctoria*, and it has a more slender and elegant aspect than *R. maritimus*. Yet the whorls of flowers, though remote at the base of the stem, are certainly crowded at the summit. The petals, however, are lanceolate, with three taper teeth shorter than the petal itself, but it may be questionable if this character, perhaps variable, will satisfactorily separate species so closely related.

The *Salices* are confessedly a difficult tribe, on the species of which botanists hold diverse opinions. I am not quite satisfied that all that could be found in the county are enumerated, and something may perhaps be done here. It is curious that *S. repens* has never been noticed, though it grows in the adjoining county of Warwick.

The white and grey Poplars (*P. alba* and *canescens*) are separately discriminated in the tabular list, though scarcely satisfactorily; for I much doubt whether they can at all times be accurately distinguished from each other, and they are probably not specifically distinct.

Among the *Orchidaceæ* there are a few critical plants deserving notice. *O. incarnata* was detected by Mr. W. Mathews, jun., in Wyre Forest: but its claims to be distinguished from *O. latifolia* appear to be but slender. *Habenaria bifolia* and *H. chlorantha* (Bab.) have a very different aspect when seen growing, and the latter is abundant in woods, while the former, which is a smaller and more slender plant, affects more open though still shady spots, and is rather plentiful in a part of the Bromsgrove Lickey district, where *H. chlorantha* is absent.

I have, however, met with puzzling intermediate forms. *Epipactis purpurata* was first described by Sir J. E. Smith from a Worcestershire specimen, and Mr. Westcombe and myself have gathered it not far from its original locality. Mr. T. Baxter also found it in Nunnery Wood, near Worcester, till choaked by the up-rising coppice wood. It may only deserve to be considered a variety of *E. media*, and it is very local. *E. media* itself is of rare occurrence in Worcestershire. Professor Babington records its position at Abberley, and a specimen I gathered in the Ham Dingle at Pedmore, near Stourbridge, is deemed by Mr. Westcombe the true plant.

Some of the Rushes (*Juncus*) will perhaps be found to have a more extended range in the county than the tabulated list shows, for *J. supinus* and *J. compressus* have not certainly been observed in every division of the county, though they will probably be found. *J. Gerardi* has been only marked in the Severn Valley.

Possibly more species of *Potamogeton* may be mustered than are recorded and marked as gathered. I have been obliged to refer a narrow long-leaved species, gathered in pools near Malvern, doubtfully to *P. heterophyllus*. *P. rufescens* is of rare occurrence.

*Eriophorum vaginatum* is not now to be found in Worcestershire, though still at Sutton Coldfield, near Birmingham. *E. gracile* has been marked from Malvern, on the authority of the Rev. Andrew Bloxam. Some years since I sent him a specimen of what I took for *E. angustifolium*, but Mr. Bloxam, or a friend of his, referred it to the rarer *E. gracile*. It has not since been certainly observed, and even *E. angustifolium* has ceased to grow at the locality.

In the tabular list *Scirpus Holoschaenus* occurs with a note of interrogation, as having been introduced in Dr. Nash's list of Worcestershire plants as once gathered at Throckmorton. No doubt some other rush was mistaken for it, but the error cannot now be cleared up.

The *Carices* tabulated are 37 species, and there is no question about any of these but *C. teretiuscula*, which is only known, if really gathered at all, in the Bromsgrove Lickey division. In the line of pools between Kidderminster and Hagley great quantities of *C. paniculata* grow, and there *C. teretiuscula* may be sought with probability of being found. Mr. Bentham unites it with the former.

*Gramineæ*.—With regard to the Grasses, I have placed them on Mr. Babington's enumeration, though it may be expected that the whole of the names he has given will not permanently keep their places in the British Flora. Indeed the experiments of Professor Buckman (late of the Royal Agricultural College)\* have clearly shown that many alleged species are only varieties of each other, while the cultivated oat may degenerate into *Avena fatua*, and the latter be "educated" to form *Avena sativa*. Mr. Buckman has shown that *Agrostis vulgaris* and *alba* are forms of the same species; and so of *Festuca ovina* and *duriuscula*, and he also combines *Festuca pratensis*, *F. loliacea*, and *F. elatior*. There can be no doubt that coarse and striking in its features as *F. elatior* presents itself, that it is truly derivable from *F. pratensis*, and Mr. Buckman states that "when first sown (in Oakley Park) it came up true enough, though with a disposition to harshness, but the last three years it has become *elatior* in all its features." Still, tall as the latter becomes, forming large *tussacs*, it is not to be confounded with the true lofty-growing and large-flowered maritime *F. arundinacea*. *Bromus* (Serrafalcus) *commutatus* my friend Buckman also views as only a variety of *B. mollis*, and has traced many intermediate states. This is very interesting as well to the agriculturist as the botanist, as is also the observation of some grasses only affecting lime-stone soils, which may be known by their occurrence there. Thus *Bromus erectus* is a perennial brome-grass "very partial," Mr. Buckman says, "to lime-stone soils, and is one of the commonest grasses on the poor thin oölite brashes,

\* Natural History of British Grasses, in Journ. of Royal Agricultural Society of England, Vol. xvii, Part ii.

extending along the whole of the Cotteswold chain of hills from Bath to Chipping Campden; it is no less prevalent on the chalk range." In like manner I have seen it on the sides of the abandoned Silurian quarries near Martley, and on the western side of the Malvern range, as well as filling calcareous pastures near the Lias at Forthampton, near Tewkesbury. As Mr. Buckman says—"whatever tends to the improvement of the pasture contributes to its disappearance, and its presence in quantity may be held as a sure sign of poverty of soil, as well as an evidence of its calcareous nature." Almost the same may be said of *Brachypodium pinnatum*, which, useless as a grass, yet on the sides of Bredon Hill, left wild, or only occasionally stocked, spreads greatly, forming rounded patches yards in diameter, wholly untouched by cattle, and thus seeds unchecked, besides spreading by short rhizomes, until much of a pasture is usurped by this coarse and distasteful species.

*Phalaris Canariensis*, *Setaria viridis*, and *Lolium temulentum* are only of occasional appearance, but the modern cultivation of *Lolium Italicum* has enabled it to establish itself in various positions all over the county. *Triticum acutum*, or *T. laxum*, Fries, is confined to the banks of the Droitwich salt-water canal.

The *Characeæ* have been elaborated into 16 British species, of which as yet only 4 have been observed in Worcestershire, and though with no large spreads of water to examine, it is not likely that many more will turn up, yet possibly a few additional forms may reward attentive research.

It may be here remarked that any plants not now marked in the tabulated list as natives of or naturalized to Worcestershire, and which formerly appeared in the "New Botanists' Guide," or in the list of Worcestershire Plants appended to Hastings' "Illustrations of the Natural History of Worcestershire," have been omitted as erroneous.\* An asterisk (\*) in the column

\* These are but few, and if in cases of doubt a critical botanist would call for evidence or ask for a specimen, instead of carping on the discriminating powers of brother explorers, truth and real facts would be easier and quicker arrived at. When a specimen can be shown, or a note or sketch made at the time, there can be no mistake. But memory only proves often deceptive.

marks the present disappearance of a plant at a locality recorded by some observer living or dead, but as experience has shown that various local species reappear, even after long intervals, they were deemed worthy of indication. *Rumex pulcher* (the Fiddle-dock), for instance, has been stated on good authority to grow in the Malvern division, where till recently I could never find it. But at last I met with it in Castlemorton churchyard; and curiously enough, Dr. Bromfield says, that he found the plant "abundantly at Charleston, South Carolina, chiefly in the areas of the churches in the city." I have also gathered *R. pulcher* in Holy Cross churchyard, Pershore.

## CENSUS.

Worcestershire possesses in the whole 953 Phanerogamous plants, and 39 Ferns, Equisetaceæ, and Characeæ, thus arranged :—

Dicotyledonous Plants . . . . .	725
Monocotyledonous Plants . . . . .	228
<hr/>	
Total Phanerogamic Vegetation . . . . .	953
Ferns, &c. . . . .	39
<hr/>	
Total Plants, inclusive of Ferns . . . . .	992
<hr/>	

This number includes a few naturalized and planted species which are marked in the tabular arrangement, and some plants that at present have disappeared from the localities where they were gathered, though possibly they may recur again. In the above enumeration the forms of fruticose *Rubi* named as species by modern observers are not given, and only *R. suberectus*, *cæsius*, and *fruticosus* allowed in this census, in addition to *R. Ideus*. If the 29 or 30 quasi-species of *Rubus* were added to the above, then Worcestershire (exclusive of the Ferns, &c.) may be said to possess nearly a thousand species of plants for its Flora. Taking Mr. Watson's estimate of 1,425 species for the plants



of Britain, then from the above statement it will appear (the forms of fruticose Rubi excluded) that our county possesses 433 fewer plants than the whole of Britain. This need not excite surprise when its moderate area is considered, its deficiency of sea coast, want of lakes, and the very moderate altitude of its hills, none exceeding 1,500 feet.

Neither Herefordshire, Staffordshire, Warwickshire, or Gloucestershire (all bordering counties) have been as yet so carefully examined as to render it possible to compare the entire botanical products of those counties separately with Worcestershire, and this can at present only be done with Salop and Oxfordshire. But that Worcestershire has been now most closely examined will appear evident, by a reference both to Walker's "Flora of Oxfordshire," on the south-east, and to Baines's "Flora of Yorkshire," edited by that careful botanist, Mr. J. G. Baker, considerably to the north. Walker has (1833) only enumerated 826 plants as growing in "Oxfordshire and its contiguous counties," though enumerating more than 40 plants that have no claim to a location within Worcestershire, and have therefore no mark in the tabulated list. The most remarkable of these may be noted, and so get a record, if they should at a future time travel over the Cotswold barrier on the line of rail or otherwise :—

*Callitriche autumnalis*  
*Salvia pratensis*  
*Agrostis setacea*  
*Thesium linophyllum*  
*Chenopodium olidum*  
*Eryngium campestre*  
*Tordylium maximum*  
*Drosera longifolia*  
*Fritillaria Meleagris*  
*Hyacinthus racemosus*  
*Asarum europæum*  
*Teucrium Scordium*  
*T. Chamædryas*

*Stachys germanica*  
*Antirrhinum repens*  
*Dentaria bulbifera*  
*Arabis Turrita*  
*Trifolium subterraneum*  
*Gnaphalium dioicum*  
*Cineraria campestris*  
*Ochis militaris*  
*O. tephrosanthos*  
*O. aranifera*  
*Herminium monorchis*  
*Ruscus aculeatus*  
*Mercurialis annua.*

Some of the above are very local, and are not likely ever to appear in Worcestershire, but they help to make up the 826 Oxfordshire plants, which, perhaps, close observation might increase.

My friend the Rev. W. A. Leighton, in his excellent and elaborate "Flora of Shropshire" (1841), says that "876 species of flowering plants are now ascertained and described as natives of Shropshire," which is 77 less than what the tabulated list for Worcestershire shows, notwithstanding that Salop has the advantage of numerous lakes, and hills loftier than any that our county possesses. Mr. Leighton has not tabulated any lists for comparison, but of course Salop, from its undrained bogs and marshes, has many paludal plants now unknown in Worcestershire, as well as a few particularly local, as—

<i>Utricularia minor</i>	<i>Vaccinium Vitis-Idæa</i>
<i>Eriophorum vaginatum</i>	<i>Andromeda polifolia</i>
<i>Rhynchospora fusca</i>	<i>Arctostaphylos Uva-ursi</i>
<i>Sesleria cærulea</i>	<i>Saxifraga hypnoides</i>
<i>Calamagrostis lanceolata</i>	<i>Silene nutans</i>
<i>Lobelia Dortmanna</i>	<i>Sedum Anglicum</i>
<i>Viola lutea</i>	<i>S. Forsterianum</i>
<i>Cicuta virosa</i>	<i>Trollius Europæus</i>
<i>Linum perenne</i>	<i>Teucrium Chamædrys</i>
<i>Drosera longifolia</i>	<i>Melampyrum sylvaticum</i>
<i>D. anglica</i>	<i>Subularia aquatica</i>
<i>Scheuchzeria palustris</i>	<i>Crepis paludosa</i>
<i>Alisma natans</i>	<i>Carex limosa.</i>

The proximity of Shropshire to Wales causes it to have several plants of a subalpine character in favourable situations, as is also the case in Herefordshire.\*

Staffordshire, as Dr. Fraser of Wolverhampton has shown in the Transactions of the Dudley Scientific Society, having still such wastes as Cannock Chase and Norton Bog, nourishes many morass-loving plants in its moorlands; and where it impinges on Derbyshire such local species as *Hutchinsia petraea*, absent from Worcestershire.

Mr. J. G. Baker, in his "Supplement to the Flora of Yorkshire," says that "in the present work 1,155 species of flowering plants and 53 ferns are enumerated;" but as many were inserted erroneously by Baines in the first edition of the work, Mr. Baker now reduces them to 956 flowering plants and 55 ferns,

\* The Rev. W. H. Purchas has, I understand, been long engaged upon the Plants of Herefordshire, under the sanction of the Woolhope Club, but his work has not yet been published.

and taking this latter enumeration as the correct one, it then appears that Worcestershire has nearly as many species of flowering plants as the large county of York, but considerably less ferns.\* Mr. Baker gives a list of 50 species of phanerogamous plants that are "supposed to find their austral limit" in Yorkshire, and it may be therefore useful to set against this list the names of such Worcestershire plants as do not progress so far north as York, though they may not be exactly limited to the northern border of this county:—

<i>Cheiranthus Cheiri</i>	<i>Cuscuta epilinum</i>
<i>Isatis tinctoria</i>	<i>Cynoglossum montanum</i>
<i>Erodium maritimum</i>	<i>Verbascum Lychnitis</i>
<i>Geranium rotundifolium</i>	<i>V. virgatum</i>
<i>Genista pilosa</i>	<i>Chenopodium hybridum</i>
<i>Poterium muricatum</i>	<i>Atriplex erecta</i>
<i>Agrimonia odorata</i>	<i>Rumex pulcher</i>
<i>Pyrus domestica</i>	<i>Populus canescens</i>
<i>Epilobium obscurum</i>	<i>Spiranthes æstivalis</i>
<i>Bupleurum tenuissimum</i>	<i>Cephalanthera grandiflora</i>
<i>Enanthe pimpinelloides</i>	<i>Epipogium aphyllum</i>
<i>C. silaifolia</i>	<i>Luzula Forsteri</i>
<i>Valerianella eriocarpa</i>	<i>Actinocarpus Damasonium</i>
<i>Carduus acanlis</i>	<i>Scirpus Tabernæmontani</i>
<i>C. Forsteri</i>	<i>Carex montana</i>
<i>Lactuca Scariola</i>	<i>Gastridium lendigerum</i>
<i>Pulicaria vulgaris</i>	<i>Bromus diandrus</i>
<i>Arnoseris pusilla</i>	<i>Serratulus racemosus.</i>

The above plants are not members of the Yorkshire Flora, and there may be a few others.

I think it scarcely necessary to classify the Worcestershire plants under those "types of distribution" proposed by Mr. Watson in his "Cybele Britannica," partly because they are not entirely satisfactory, and too little is known with certainty as to the original location of plants, or the mode of their distribution. Some plan of the kind may be necessary in grouping the entire vegetation of a kingdom, though many exceptions will occur, and there must be much of arbitrary assumption. I prefer to mention such facts as seem curious, especially in regard to what appears the selection of plants in their localities, or to

\* I have not taken the "aliens" into account, which increases the Yorkshire plants to above a thousand.

the chances to which they are subject. This is evident in the absence of various plants from Worcestershire.

Thus *Diplotaxis tenuifolia* has no place in this county, though abundant at Tenby, in South Wales, growing on walls at Gloucester, and also at Shrewsbury and Chester. It is surely not for want of old walls to grow upon. *Arabis hirsuta*, though a Cotswolde plant and a native of Salop, has no location in Worcestershire.

No species of *Cochlearea* (Scurvy-grass) occurs in this county, though found in the low country below Gloucester, while *C. danica* grows on walls at Shrewsbury. One might have thought the latter more likely to be found near the salt-water Droitwich Canal than *Glaux maritima*.

*Trifolium scabrum* is another absentee; and *Sedum anglicum*, though located in Herefordshire, has found no spot for a resting place even on the Malvern Hills. *Sedum rupestre* is only known as a garden escape. *Saxifraga hypnoides* is also absent, though there are places that would well enough suit its growth.

The want of lakes and morasses no doubt represses many marsh plants from appearing, though this is scarcely sufficient to account for the absence of *Cicuta virosa*. The wild Celery (*Apium graveolens*) is on the other hand exceedingly abundant. *Antennaria dioica* has localities both in Gloucestershire and Shropshire, but with much woody ground this county is passed over. *Cineraria campestris* comes close to the border at Broadway, but does not pass it. *Carduus tenuiflorus* is also unknown, though located both in Oxfordshire and Shropshire. *Crepis paludosa*, also, though a native of Salop and Stafford, is unknown in Worcestershire. The Orobanches are uncommon, and the Ivy Broom-rape (*O. Hederæ*) nowhere occurs.

Some plants formerly numerous are dying out, as *Cynoglossum montanum*, all but extinct; *Pedicularis palustris*, and *Parnassia palustris*, which barely maintain two or three localities; and one only occurs for *Cuscuta Epythymum*. *Samolus Valerandi* has become very uncommon. Particular plants move about in a

capricious way, like *Dianthus Armeria*, or *Ophrys apifera*, seldom or never to be found in the same spot in succeeding years; and the same may be said of *Epipactis latifolia*, that delights in new locations of fir groves. *Cephalanthera grandiflora* is another of the orchideous tribe, truly native, yet seldom or ever to be seen again at the spot where it formerly appeared.

*Salix repens* or *fusca* is unknown in Worcestershire, though occurring in various places in Oxfordshire, Warwickshire, and Shropshire.

Other plants that present themselves at times, or even constantly, in a semi-naturalized state, might have been made to swell the Census, as *Eranthus hyemalis*, *Adonis autumnalis*, *Silene Armeria*, *Lonicera tatarica*, *Iris Xiphium* (mentioned by Dr. Nash as found by the Avon), *Lilium pyrenaicum*, and others, often said to be "truly wild," but such plants, evidently the relics of, or extension from, garden cultivation, ought not to be numbered in an indigenous Flora, though demanding notice when like *Coronilla varia*, plentiful on the banks of the Severn near Bewdley, or extending permanently like *Linaria cymbalaria*, or the still advancing *Anacharis Alsinastrum*, however introduced. Some judgment must be shown in this, as plants will occur at times tempting (especially to a young botanist) to introduce as a discovery. Thus our Club, in an excursion in 1858, found some quantity of *Lilium pyrenaicum* in Wyre Forest, by a rill that falls into Dowles Brook, between the brook and the old Sorb-tree. No one could tell how the plant got into this forest locality, where it appeared to be thriving and increasing, but still no judicious botanist would give it a nativity at the spot as anything else than a fortuitous outcast.

Dr. Bromfield, in his "Flora of the Isle of Wight," has advisedly excluded "every tree, shrub, or herb whose pretensions to admission rest on the universality of its cultivation, or subserviency to purposes of ornament or utility." But I have introduced the ligneous species "of native growth within the realm," though planted in parks and woods originally,

because really contributing to the *present physiognomy of vegetation*, and thus *generally conspicuous*; but the pl. for planted, or the dagger (†), precludes any misconception. There is another valid reason. Many proprietors of woods and wastes have taken to the plan of introducing continental species among native vegetation, and if this was not remarked, some future botanist might indicate a fancied discovery on the very ground of such species being unnoticed before as planted trees. Several places in England are named after the Box, which gives the *idea* of the *Buxus* being indigenous at such localities, and so with other trees certainly introduced some time or other. The common Elm (*Ulmus suberosa* or *campestris*), admitted by Dr. Bromfield himself contrary to the principle stated above, and only because "abundant all over the island in hedgerows," is really as much an interloper as the Spanish Chestnut, which I have seen mixed up with native vegetation in Shrawley Wood and Birchin Grove, in this county; while in like manner the Box has been placed for ornament among the wild thickets of Bredon Hill. Even the spontaneous appearance of seedlings is not a rule to trust to, for I have seen evidence of the natural production of the Cherry, Sycamore, Beech, Fir, and even Larch and Laburnum, though these are all of foreign introduction to Worcestershire, as well as the Hornbeam, though the latter may be indigenous in the south-east of England. The Elder (*Sambucus nigra*), so generally associated with cottages and churchyards—"the stinking Elder, grief,"—as characterized by Shakspeare, is almost as suggestive of a foreign origin as the common Elm. The Privet (*Ligustrum vulgare*) may be instanced as a coast plant, which certainly in hedges has been disseminated almost as much as the Hawthorn. Yet, along the whole range of the Malvern Hills I have only observed it as truly native in one spot. Wild plants taken into cultivation may, and do, flit from it, and get into spots far from their original native home if they have the opportunity. Thus the *Asparagus* has recently appeared on newly-built rough and thick stone walls at Malvern, and if

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getting on to the hills themselves, may be esteemed native there by future observers. Thus man and nature exchange with each other.

The plants that have been noted in the four botanical divisions of Worcestershire may be thus compared with each other :—

	AVON.	SEVERN.	MALVERN.	BROMSGROVE.
Dicotyledonous plants	522	643	601	501
Moncotyledonous	145	202	187	153
Total . . . .	667	845	788	654

Thus it appears that the Severn Valley is most prolific in species, which may be ascribed not only to the habitats afforded to plants by the extent of the river banks through the whole county from north to south, but by the native forest ground that is included, as well as much sandy country. The number of species may be taken at 845 (excluding the Rubi and all planted trees), and this is only 100 less than the whole county produces.\* The Malvern and Teme district is the next in numerical value, while the northern division of Bromsgrove Lickey possesses 191 plants less than the Severn, and 291 less than the whole county. No doubt the Severn district has been best explored, and possibly a few plants may have escaped notice in the Bromsgrove division, but the surface clay between Bromsgrove and Birmingham is very barren of plants, and the borders of “the Black Country” is by no means favourable to the growth of the beauties of Flora. Except the *Ericas* and the *Vaccinium* of the high ground of the Lickey, still in places in its original moorish state, and a few bog plants that, like *Viola palustris* and *Rhynchospora alba*, linger near the pools at Moseley, there is nothing very remarkable or entirely confined to this division of the county. *Atropa Belladonna* may be met

\* I find by a Report of the Woolhope Naturalists' Club, published in 1856, when the Rev. J. F. Crouch was President, that Mr. Purchas had then “satisfactorily ascertained” about 750 flowering plants and ferns as natives of Herefordshire, but expected to make up 800, which is a less number than may be gathered in the Severn Valley alone. But it has taken more than thirty years to catalogue the entire plants of Worcestershire.

with at Dudley, and maintains its position, though perhaps originally an outcast from the neighbouring Priory. *Melittis melissophyllum* was found in Withering's time near Halesowen, but it has not been met with there by any recent observer.

The Avon Division bordering on Warwickshire and Gloucestershire retains in its level parts such local plants as *Ranunculus lingua*, *Smyrnia olusatrum*, *Villarsia nymphæoides*, *Samolus valerandi*, *Euphorbia platyphylla*, *Acorus Calamus*, and *Potamogeton densus*; while the oölitic heights of Bredon and Broadway nourish the following species, all unknown in other parts of the county:—

*Anemone pulsatilla*  
*Thlaspi perfoliatum*  
*Reseda lutea*  
*Alsine tenuifolia*  
*Astragalus hypoglottis*

*Hippocrepis comosa*  
*Fragaria elatior*  
*Pyrus Aria*  
*Asperula Cynanchica*  
*Cuscuta Epithymum*.

One tree of *Pyrus Aria* has been observed in Wyre Forest, which is the only exception.

The Severn Valley in its native woods and the borders of its streams running into the Severn, has also some local plants not hitherto observed in the other divisions, and the following may be particularly mentioned:—

*Thalictrum minus*  
*Sisymbrium Sophia*  
*Isatis tinctoria*  
*Cerastium arvense*  
*Rubus saxatilis*  
*Lactuca virosa*  
*Pyrola minor*  
*Gentiana campestris*

*Hottonia palustris*  
*Cephalanthera ensifolia*  
*Sparganium minimum*  
*Carex curta*  
*Carex elongata*  
*Carex digitata*  
*Carex montana*  
*Festuca sylvatica*,

with others that are shown in the arranged catalogue. Its saline plants growing by the Droitwich Canal are specially adverted to in the detailed account of the Severn Valley.

The Malvern and Teme Division being particularly described in its place further on, it need only be here remarked that the special or rarer plants mentioned in the "Botany of the Malvern Hills" some years since, yet maintain their places, though some of them it must be confessed in smaller numbers than formerly.



The following as very local deserve mention :—

Potentilla verna	Carduus pratensis
Vicia bithynica	Limosella aquatica
Lathyrus palustris	Anagallis tenella
Sedum album	Centunculus minimus
Bupleurum tenuissimum	Polygonum minus
Myrrhis odorata	Daphne mezereum
Pulicaria vulgaris	Gagea lutea*, &c.

On the Malvern Hills many plants, from the turf being kept closely nibbled by sheep all the year round, are very much diminished in height, as was remarked by Dyer, the author of "The Fleece," of other commons and airy downs in various parts of England.

——— "The fairest flocks

The close wov'n carpet graze ; where Nature blends

Flow'rets and herbage of minutest size,

Innoxious luxury."

Probably the force of the wind over the bare ridges of rock has its influence, for I have noticed a very small variety of *Hieracium pilosella*, which in Malvern Botany I named *brevicaulis*, on the summit of the Herefordshire Beacon, having a very short scape. *Carlina vulgaris* also grows almost stemless on the sides of the hills. Some of the cudweeds, too, are very dwarf. Geologists have speculated on the former greater altitude of the Malvern Hills, and my friend, the Rev. W. S. Symonds, the able and sagacious President of the Malvern Club, has suggested that the *Gentianas* might have grown there native as upon the Alps ; but there is no relic now left to indicate that the Malvern chain ever possessed an Alpine vegetation. Even *Saxifraga hypnoides* is absent, the occurrence of which might have been deemed probable, as it grows on the Salopian Cleve Hills, nor does a single species of *Lycopodium* occur.

In the tabulated list I have included the local orchid *Epipogium aphyllum* as by its position attached to Worcestershire,

\* The *Gagea* was first pointed out to me by the Rev. Dr. Cradock, Principal of Brazenose College, Oxford, who was President of the Club when resident in Worcester as a Canon of the Cathedral. I am indebted to Mr. J. S. Haywood, of Worcester, for evidence of the continued growth of *Daphne mezereum* at Shelsley, and *Lathyrus palustris* has been gathered by several members of the Club, as well as by myself.

though within the boundary line of Herefordshire, but it is now gone, and cannot, therefore, permanently belong to the English Flora.

The 970 tabulated plants of the county are included in 86 Orders, and 402 Genera, but the following Genera may be excluded as decidedly introduced and certain of their species planted in modern times, viz., *Sempervivum*, *Petroselinum*, *Melissa*, *Fagopyrum*, *Aristolochia*, *Buxus*, *Fagus*, *Castanea*, *Carpinus*, *Pinus*, *Abies*, *Larix*, and *Asparagus*. This reduces the Orders to 85, the Genera to 390, and the species, after weeding out the absolutely certain introductions of man, to 945\*.

The total of Britain, according to Mr. Watson, exhibits—Orders 98, Genera 496, and Species 1,425; and he states in his “Cybele” that Mid. Britain (which includes Worcestershire) has—Orders 94, Genera 434, and Species 1,148. North Britain has only Orders 79, Genera 363, and 930 Species. Thus Worcestershire possesses in itself more Orders, Genera, and Species than the whole of North Britain put together, but 9 Orders, 44 Genera, and 203 Species less than the whole of Mid. Britain.

The Equisetaceæ, Ferns, and Characeæ, tabulated separately are thus distributed:—

AVON, 20; SEVERN VALLEY, 30; MALVERN, 32; BROMSGROVE, 27.

Of the Ferns, *Allosorus crispus* has only been met with in one place on the Malvern Hills; and *Asplenium viride* upon Ham Bridge, lately rebuilt, and the habitat, therefore, is now unproductive, though the plant may possibly re-appear. Among the Lycopodia, the *L. Selago* has only occurred at Moseley, where it is to be feared it is now extinct, or will soon be so; and *L. inundatum* on Hartlebury Common, where it yet exists.

\* At the same time it must be admitted that there are included in this number many species of such old colonization that they are not now to be separated from truly indigenous plants in their present localities and distribution, so that to draw an absolute line of separation would be now impossible. All that can be satisfactorily done is to array the vegetation of the country as at present apparent.

## PHYSICAL GEOGRAPHY.

Worcestershire is one of the midland counties of England, not far removed from its centre, and extends in latitude from  $52^{\circ}$  to rather beyond  $52^{\circ} 30'$  north; and in longitude from about  $1^{\circ} 30'$  to  $2^{\circ} 30'$  west. Its outline is exceedingly irregular without any definite natural lines to mark its boundaries, except the Malvern Hills on the west, so that its plants become curiously mixed up with those of its neighbours as they mutually dovetail upon each other. Its mean length may be taken at thirty miles, and the breadth twenty-five miles, and Mr. Pitt estimates the contents of the county at 750 square miles, or 480,000 acres, and he adds 20,000 for detached parts.\* Mr. J. Marshall, writing in 1829, gives the statute acres at 466,560, but Hales Owen, then in Shropshire, and Clent has since been added to Worcestershire, so that Pitt's estimate of 500,000 may be permitted to pass muster in round numbers, the isolation of Dudley surrounded by Staffordshire being yet retained, as well as Shipston-on-Stour and Blockley extending into Warwickshire and Gloucestershire on the east and south. The adjoining counties, as shown in the map, are Staffordshire on the north, Shropshire on the north-west, Herefordshire on the west and south-west, Gloucestershire on the south, and Warwickshire on the east. The Severn, entering from the north, divides the county into two irregular portions, two-thirds of its superficies lying on the eastern side, and one-third on the western side of the river. The river Teme enters from Shropshire on the north-west, making a very irregular and devious course to Powick, joining the Severn about a mile-and-a-half south of Worcester. The Warwickshire Avon waters the celebrated Vale of Evesham from Cleeve Prior to Tewkesbury, where it increases the volume of the Severn, having itself

\* Pitt's Agricultural Survey, *in loc.* Dr. Nash roughly estimated the acreage at 600,000, while a Parliamentary estimate mentioned by Laird, as well as Hastings (Illust. Nat. Hist., Worcester), reduced it to 431,360, but this was exclusive of Halesowen, now added to Worcestershire.

tributaries in the Arrow and the Bow ; while the Teme receives the Rea, Sapey Brook, and Leigh Brook ; and the Severn itself is recruited by the Stour at Stourport, and the affluent of the Salwarp three miles above Worcester. The whole drainage of the county, including the brooks from the Malvern Hills is conveyed into the Severn, with the exception of a small portion of the county on the north-east, which is intersected by the little river Rea, that has its source on Bromsgrove Lickey, and passing through the lower part of Birmingham finally disembogues itself in the Trent. Another small stream rising in the marshy ground of Moseley passes by Yardley in the same direction. The Severn and Avon flowing through nearly level meadows, are liable to overflow after heavy rains, or rapid thaws in the upper country, occasioning at times wide spreads of fresh water, which, however, soon subside ; but this necessarily requires the fields close to these rivers to remain in pasture, and moreover there are common rights in connection with these "hams" or holmes, which compel them to be left open. The valleys of the Severn and the Teme are nearly on a medium level, at about 70 feet above the level of the sea, but the valley of the Avon is lower, the waters of the latter joining the Severn at a point where it is influenced by the spring-tides or "bore," as it is termed. The tidal flow formerly affected the river up to Worcester at high tides, but these are now restrained by the weirs placed by the Severn Commissioners at Diglis and Tewkesbury.

There are several artificial navigable canals connected with the Severn, the chief of which are the Staffordshire Canal and the Worcester and Birmingham Canal ; but in a botanical point of view the salt-water canal from Droitwich to the Severn a distance of about five miles, merits particular notice.

There are no natural lakes in Worcestershire, and the only pools of any importance that call for particular notice are those that form a chain of drainage from the Clent Hills to Kidderminster. These stretch through a depression in the country by Wilden, Hoobrook, Spennels, Stankland, and Hurcott, all

pools, to Broadwaters, near Kidderminster, where four meres form its splayed head, and the whole at length slightly communicate with the Severn at Lincombe. In earlier times they were doubtless more important and extensive. Perhaps also the artificial lake at Westwood, and Pirton Pool, near Kempsey, may be mentioned. The others are inconsiderable. The only accumulation of water that at times puts on the appearance of a large lake in rainy seasons is Longdon Marsh, near Upton-on-Severn, which altogether forms a waste of about 3,000 acres; but a commission is at present engaged in the somewhat expensive project of draining it, with what results remains to be seen.

Mr. Pitt, in his *Agriculture of Worcestershire*, estimated the "wastes and commons" of the county at 20,000 acres, but so many of these have been now enclosed that probably not more than 4,000 or 5,000 acres at present remain as waste independent of woods, for nearly the whole of the Malvern Chace has now been "taken in," and most parishes have adopted the advantages offered by the general Inclosure Act. Many woodlands have also been broken up, though Wyre Forest still remains almost intact.

With regard to the geology of Worcestershire, it may be generally stated that the vale of the Severn, and great part of the west and extreme east of the county, is part of the Trias, or new red sandstone formation that prevails in the centre of England, Keuper marl predominating, while extensive beds of gravelly drift are accumulated near the banks of the rivers, and rising to a considerable height above their beds, intermixed with wedge-shaped masses of sand. These form what Mr. Symonds terms "antient river terraces," beyond the present alluvial deposits.\*

\* As remarked by my sagacious and observant friend, the President of the Malvern Naturalists' Club, these river-terraces are well marked at Upton-on-Severn, Tewkesbury, Worcester, and Gloucester, on the Severn; and at Eckington and Cropthorne, on the Avon, the ancient river drift is well exposed. During this large river epoch it is very evident that many of our valleys, once lakes, in the course of ages have gradually been silted and filled up. Such must be the history of the flat marshy lands at Longdon, Eldersfield, and Apperley, which were first back-waters of the Severn estuary, and afterwards for a long period fresh-water lakes. See the interesting "Stones of the Valley," by the Rev. W. S. Symonds, F.G.S.

Without entering upon the origin of this drift, it is sufficient to say that it contributes to form a good deal of sandy-surfaced country, more especially between Bewdley and Worcester, and a remarkable expanse occurs forming Hartlebury Common, still unenclosed. Many local names mark this sandy country, as Sandlyn, Linkcomb, Sandsome Fields, the Sandpits, &c.

On the declivities of the Upper Bromsgrove Lickey are pebble beds in the new red formation, so incoherent as scarcely to be distinguished from superficial gravel of comparatively modern date, and this has been dispersed over the surface of the country. In the Vale of Evesham, which is watered by the Avon, the latest deposits consist of clay, gravel, and sand, in various proportions, and scattered about with capricious irregularity. Here, too, is much gravelly drift, derivable from the oölitic escarpments.

The Lias formation occupies the south-eastern part of the county, capped by the Inferior Oölite at Bredon and Broadway, and this consequently forms one of the four Botanical Divisions I have set apart for examination.

The Severn Valley of red marl and sandstone, with deposits of drift, which includes both sides of the river to its junction with the Teme, and the eastern bank afterwards, forms another grand division.

The Bromsgrove Lickey Division includes the quartz, or altered Llandovery Rock of the Lower Lickey, the Permian heights of the Upper Lickey and Clent Hills, and the lower ground of the Permian clays, as also the Silurian limestone at Dudley, and the basaltic eminences near that place rising from the coal-field of South Staffordshire.

The Malvern and Teme Division, fully detailed further on, takes not only the Keüper marls to the Malvern Hills, but those syenitic and metamorphic heights themselves, the Silurian deposits on the western side, and their broken line stretching towards Abberley, as well as that portion of "the Old Red" occupying the country between Whitley and Tenbury. This

corner of the county has its surface locally modified by springs that have deposited a considerable quantity of travertine.

The principal eminences of the county, when viewed from the hills on the eastern side of the city of Worcester, may be thus enumerated. To the west, at the distance of about eight miles, the Malvern Hills extend in a slightly curving line from north to south for nine miles. From their northern termination a belt of heights belonging to the Silurian system extends in picturesque outline to the Abberley Hills in the north, the Severn Valley intervening between the latter and the Clent Hills, while in the eastern horizon the fir-crowned top of Bromsgrove Lickey is conspicuous. In the south-east the lias hills of Cracombe, near Evesham, are seen with the massive bulk of Bredon Hill in advance of the Broadway Hills of the oölitic series, and the distant escarpment of the Cotswolds that fills up the southern view, where in the far distance May Hill, faintly visible, appears to unite with the last protuberances of the Malvern chain.

None of the hills attain a height beyond 1,500 feet, which is the utmost height of the Malvern Hills (1,444 feet exactly by Ordnance Survey),\* while the Broadway Hills of the oölitic series only reach 1,086 feet, Bredon Hill being 979 feet (Ordnance Survey). The Silurian heights north of Malvern do not exceed 732 feet (the Old Storridge), and the summit of Woodbury, the highest of the Abberley ridges, “determined trigonometrically” by the Ordnance Survey, according to Phillips, is 975 feet. The Upper Bromsgrove Lickey that overlooks the older chain of altered Llandovery Rocks may be approximately taken at rather more than 900 feet, and Mr. Jukes marks the Clent Hills as 950 feet, which is probably an over-estimate.† Part of the Rowley basaltic hills come near

\* The Malvern Hills gradually diminish in height as they trend southward, and Professor Phillips says—“We find the lowest of all the Malvern Hills, the Keys-end Hill, a single irregular mound rising out of a plain which is about 300 feet above the sea, to an elevation of [only] 665 feet.” See Phillips in *Mem. of Geol. Surv. of Gl. Brit.*, vol. ii., p. 11.

† Jukes—“Records of the School of Mines.”

to the town of Dudley, an isolated portion of the county surrounded by Staffordshire, and the highest of these is 820 feet. The hill on which Dudley Castle stands is 730 feet in altitude (Jukes.)

From this it clearly appears that the whole of Worcestershire is included in Mr. Watson's "Agrarian Region," and scarcely gets beyond the "Mid-agrarian Zone" within that region, limited to an elevation of about 300 yards. But though the Bromsgrove Lickey Division at the level summit of the Worcester and Birmingham canal at Tardebigg and thence to Birmingham only attains an elevation of 428 feet, which is about 350 feet above the average altitude of the Vale of Severn in Worcestershire,\* yet there is a greater difference in the climate and the aspect of the vegetation here than would seem to be warranted by the mere difference in height. This probably arises from the position of the hills and the greater *general* elevation of the country, while the Vale of Severn is open to the modification that arises from its nearer proximity to the Bristol Channel. Thus it is that the corn harvest is more than a fortnight earlier in the Vale of Severn than in the higher country north of Bromsgrove; and as remarked by Mr. Williams, an eminent horticulturist, who long resided at Pitmaston, near Worcester—"In severe winters plants are less injured in the neighbourhood of Worcester than about London."†

Though the enclosure of Bromsgrove Lickey has much altered the rude sub-alpine aspect it once possessed, yet enough remains to indicate what it was in a pristine state, and give it features of a wilder character than any other part of Worcestershire. Some of the hills of the Lower Lickey are yet rough with a dense clothing of ling and heath that is blackened in the gloom of a wintry sky, while the autumnal Gorse grows stiff

\* From the Severn at Worcester to Tardebigg, near Bromsgrove, a distance of 15 miles, there is a rise of 428 feet by 71 locks, and thence to Birmingham, 14 miles (nearly the whole distance within Worcestershire) is level. *Cary's Inland Navigation*.

† Hastings' "Illustrations of the Nat. Hist. of Worcestershire," p. 124, and Midland Medical Reporter.



and horrent almost shrubby, and dense thickets of glandulose brambles stretch along the bases of the heathy hills. The brooding vapours almost continually upon the heights are favourable to the growth of Mosses and Lichens, and here more Sphagnum and Reindeer Lichen abounds than in any other part of Worcestershire. The *Parmelia physodes* is particularly plentiful, and covers trunks of trees, paling, and everything. The grey *Bæomyces* is also very common, and in the autumnal season the tribe of *Fungi* are exceedingly profuse, the brilliant scarlet pileus of *Amanita muscarius* being often conspicuous.

This portion of the county as part of the water-shed of England merits especial notice, and is thus alluded to by Professor Jukes in his account of the South Staffordshire Coal Field—“The high ground that stretches from the Frankley Beeches to the Clent Hills gives rise on the one side to the little river Stour, running by Halesowen and Stourbridge to Stourport, where it joins the Severn, and with it flows into the Bristol Channel; while on the other side are the sources of the little river Rea, that flows through Birmingham into the Tame, and thence into the Trent and German Ocean.” In illustration of the features of this part of the country which is so well known to him, my friend and brother officer Mr. W. Mathews, jun., who has distinguished himself by his correct survey of the Alps of Savoy, while exploring as a member of the Alpine Club, has sent me the following graphic note:—“On the northern part of the tract of Severn drainage, the range of the Clents and the great water-shed (alluded to by Mr. Jukes) form an enclosure like the letter V, the point of which is at the end of Bromsgrove Lickey. The bottom of the V is, however, cut off by a transverse ridge connecting Romsley Hill with Frankley Beeches, and an amphitheatre with a northern aspect is thus formed, containing the sources of the Stour, which, after passing by Halesowen, Stourbridge, and Kidderminster, enters the Severn at Stourport. The little streams which join together

to form the Stour have cut themselves gorges through the clay, which is the materiel of the valleys down which they run, and these secluded glens, generally lined with wood, give a very picturesque appearance to this portion of Worcestershire. To the south of the Lickey another amphitheatre, somewhat similar to the above, contains the sources of the river Arrow, which waters a valley extending through the extreme western part of Warwickshire, and passing by the town of Alcester joins the Avon at Salford Priors, just before it enters Worcestershire." With regard to the nature of the surface of the Bromsgrove Lickey country, Mr. Mathews thus observes:—"That part of Worcestershire which lies between the range of the Lickey and Clent Hills and Birmingham [coloured blue in the map] consists chiefly of new red sandstone, and skirts the Coal Field of South Staffordshire from Hagley to the neighbourhood of Halesowen, where a tongue of coal-measures on which the town stands runs into the new red district for about two miles up the Stour Valley. Between Halesowen and Birmingham this division of the county is still bounded by the same coal-field, the boundary line of Worcestershire being taken as its limit to the north and east, while on the south it may be considered as terminated by the junction of the New Red Sandstone with the saliferous marls. The aspect of this district is very different from that of the Severn Valley, and instead of presenting the warm and genial appearance of the latter, it looks exposed and dreary, and the temperature is much colder. Many of the most characteristic plants of the marly plain of Worcestershire are here entirely wanting; for instance—*Campanula patula*, which flourishes most luxuriantly just on the Kidderminster side of the village of Hagley, ceases to exist when the ridge of the Clents is crossed, and only on the other side of the village. This difference has been caused by that deposit of drift clay which covers nearly the whole country between the Clents and Birmingham."

Thus the distribution and localization of plants will be influenced to a considerable extent by the mineralogical con-

ditions of the surface ground, whether that be clay, sand, or limestone, or a mixture of various ingredients. As regards the geology of Worcestershire, the limited coal field of Wyre Forest, in the north-west of the county, demands notice, though its phanerogamous plants (included in the Severn Valley Division) are due rather to the native forest in which they grow and the bogs that occur in particular parts, rather than to the chemical or mineralogical constitution of the soil. Yet the effect of this on the growth of cryptogams is very obvious, for wherever charcoal is burnt the abandoned space is quickly covered with a dense growth of *Marchantia*, *Funaria hygrometrica*, and *Boletus perennis*, the latter being unknown elsewhere. Considering how woods are overgrown with such mosses as *Hypnum triquetrum* and *purum*, *Jungermannia asplenoides*, &c., the cryptogams must be considered to exercise an influence as a predominant part of vegetation, scarcely sufficiently appreciated.

## RAINFALL AND TEMPERATURE.

Atmospheric influences, in conjunction with those of the sun and of the latitude, determine or modify in some degree the vegetation of a country, and united constitute what is termed climate. Hence the rainfall of a district is usually referred to, and in the comparison of one region with another this may be a useful test, provided the observations are really accurate and fit for comparison. But within a limited range of country the observations of a few years will scarcely form very reliable data, while the *average* rainfall of a number of years will only prove the old saying, that—

“ Nothing so surely pays its debt  
As rain to dry, and dry to wet;”

and consequently vegetation can be only affected by the transient influence of a dry or a wet season, which is balanced one by the other.

The effects of temperature are more permanent, and influenced by latitude and elevation better marked and determinable, especially on a grand scale. But in such an artificially bounded tract as a county very careful observations are needed, and there are local peculiarities which, though popularly appreciated, are not so easily explained on philosophical principles. Generally, as Sir Charles Hastings has said,\* "the climate of this county is soft, warm, and healthy;" but this would not apply to the Bromsgrove Lickey country, which is moist, bleak, and ungenial. So that the Severn Valley, with its earlier vegetation and sunnier aspect, may well be contrasted with the colder climate of the north of Worcestershire. But the country at the base of the Malvern Hills, elevated more than 400 feet above the Severn, has a peculiar salubrity favourable not only to health, but the conservation of vegetation. This was remarked by Dr. Addison, in a paper on the climate of Malvern, published many years ago, and Dr. James Williams, in his "Observations on the Malvern Winter Weather" (1860), fully confirms what Dr. Addison and my own experience shows, that "many exotics flourish through the winter in the open air at Malvern, which would perish by night frosts in the valley below." Though in the severe winter of 1859-60 numerous Laurustines, Bays, Arbuti, &c. were totally destroyed in Devonshire and Herefordshire, and also in the lower parts of Worcestershire, and rose-trees were killed by thousands, yet about Malvern scarcely any destruction of shrubs took place. This immunity from intense cold is attributable to the moderate elevation of the ground, the dryness of the atmosphere, and the absence of the fog that overspreads the vale below.† Thus, as observed by Dr.

\* "Illust. of Nat. Hist. of Worcestershire," 8vo., p. 123.

† Dr. Williams justly remarks, that "few persons unacquainted with the effect of elevation upon temperature would believe the difference caused by a few feet even;" and gives the following curious fact, forwarded to him by a gentleman in the county:—"On one occasion I examined the damage done to the blossoms of a pear-tree growing in the bottom of a valley, after a night's calm frost; at 10 feet from the ground 96 per cent. were killed, at 20 feet above 40 per cent., and at 30 feet elevation only 18 per cent."

Addison, "moderate elevations are much less subjected to the effects of *terrestrial radiation* (and consequent fall in the temperature) than places lower down."

As the average temperature of the year probably offers no great contrast between Great Malvern and Worcester, the latter being about 51°, it may be best to compare Malvern with Birmingham, where numerous observations have been made in former years by Dr. Ick, and more recently by Mr. Plant, Mr. W. Southall, and Mr. D. Smith. The height of Birmingham being (at Camp Hill) 416 feet above the sea level, and the base of the hills at Malvern being nearly 500 feet above the Severn, renders the comparison appropriate, especially as the level of Birmingham corresponds with a considerable extent of the Bromsgrove Lickey country.

Dr. Ick, from eight years' observation (1837 to 1844) made at the Philosophical Institution, Birmingham, places the mean temperature there at 48°, and this accords with the observations of Mr. W. Southall and Mr. D. Smith; or the mean summer and autumn temperature may be thus placed, to which Wolverhampton may be added as the temperature of "the Black Country," on authority of Mr. Thrustans:—

#### MEAN TEMPERATURE OF THE SEASONS.

Birmingham	{ Spring	49·01	Wolverhampton	{ Spring	48·0
	{ Summer	61·46		{ Summer	60·0
	{ Autumn	50·35		{ Autumn	49·7
	{ Winter	38·78		{ Winter	38·3

Mr. Thrustans remarks that his observations refer to "town temperature," and he fixes the mean at 49°—a degree higher than Dr. Ick's estimate for Birmingham.\* This may be compared with what Dr. Addison has placed on record, as under:—

Malvern	{ Spring	47·0	London	{ Spring	49·0
	{ Summer	59·8		{ Summer	65·2
	{ Autumn	50·1		{ Autumn	52·7
	{ Winter	41·3		{ Winter	41·1

\* Garner, in his *Natural History* of Staffordshire, puts down the mean temperature of the county at 49·14.

The mean temperature of Malvern for the whole year being  $49^{\circ}6$ , and that of London  $52^{\circ}0$ . My friend, Dr. Williams, of Lindfield, Malvern, who has paid great attention to meteorological researches at that place, and has made some most interesting observations from year to year on "Malvern Winter Weather," has sent me the temperature for four years (1862-66), the average of which will stand as under in the four seasons :—

MEAN TEMPERATURE OF THE SEASONS AT MALVERN.

Spring	47.0 ...	Summer	59.8 ...	Autumn	50.1 ...	Winter	41.3	<i>Addison.</i>
"	47.1 $\frac{1}{2}$	"	59.1 $\frac{1}{2}$	"	49.9	"	40.0	<i>Williams.</i>

The average of the whole year Dr. Williams places at  $49\frac{1}{2}^{\circ}$ . The estimate of Dr. Ick for Birmingham appears from the later observations of Mr. Thomas L. Plant, well known as an eminent observer, to be fixed rather too high, for that meteorologist, in his published Report of 1861, puts the temperature of that year at  $47\frac{1}{2}^{\circ}$ , and the average of ten years at  $47\frac{3}{4}^{\circ}$ . Mr. D. Smith, however, gives  $48^{\circ}4$  as the mean temperature of Birmingham in 1861, and  $49^{\circ}$  in 1863, so that perhaps  $48^{\circ}$  may still stand good, and  $48\frac{3}{4}^{\circ}$  was, in fact, the average temperature of 1866. At Worcester, in the former year (1861), the mean temperature was as high as  $63^{\circ}7$ .\* Cloudy days will, however, have a greater effect upon the progress or retardation of vegetation than temperature alone, but the proportion of cloudy to sunny days in successive years has not been sufficiently recorded.

Though the actual difference in degrees of temperature between Malvern and Birmingham is not very great, yet, as before intimated, what Mr. Pitt wrote in the "Agriculture of Worcestershire" in 1810 is still applicable to the Bromsgrove, Lickey Division now. He says—"This district from its height, exposure, and inclement atmosphere may be considered in point

\* I presume this to be an exceptional year; but when the range of temperature is very great in any one year, the average temperature of that year must be deceptive as to any general result, and half a century of observations are required. Thus I find it reported from the "Worcester Meteorological Observatory," that in 1859 the maximum temperature was  $91^{\circ}8$ , and the minimum only  $5^{\circ}8$ . No general analysis has been lately published from this Observatory as it ought to be.

of climate as three or four degrees more north (in latitude) than the fertile part of the county"—the Vales of Severn and Avon. My friend Mr. W. Mathews, jun., intimates the same thing, as he remarks in a MS. of which I have availed myself, that owing to what he calls the "intractable clay," in combination with "the great elevation of the district, have produced so ungenial a climate, that the harvest in these parts is among the latest in England." Writing on October 26, 1853, Mr. Mathews says—"There is much corn still uncut." Yet the mere height of little more than 400 feet above the sea would seem to be inadequate to account for this anomaly.

### RAINFALL.

The rainfall of any district must vary greatly in different years, no doubt at the time affecting vegetation accordingly by drought or an excess of moisture, which is ultimately balanced; but some districts appear constantly to have a greater share of rain than others. It is stated in a paper on climate in Morton's "Cyclopædia of Agriculture," that the western counties have 50 per cent. more rain than the eastern, but I should consider this estimate too great. It may be dubious whether any stated average rainfall can be much depended upon as an ingredient in estimating climate; and though I shall detail the information I have obtained from various sources, it only appears to establish a somewhat greater fall of rain in the northern part of the county than in the Vales of Severn and Avon, or even in the vicinity of the Malvern Hills, attractive of clouds as that chain would seem to be. Mr. Watson, in reference to this subject, has remarked that "the hills are more humid than the plains and other low grounds, if not by the absolute quantity of rain that falls on them, by the frequency of showers and mists." This does not well apply to the Malvern chain, which has scarcely a bog on the hills themselves, and whence from their narrowness and steepness the rain quickly runs off. The Lickey

Hills being broader, with intervening glens, are wetter, and so nourish more plants loving moisture.

Dr. Ick, of Birmingham, who was Curator of the Philosophical Institution there, registered the rainfall for seven years, from 1837 to 1844 inclusive, and has stated the average fall to be 25·900 inches. This would, however, appear to be too little, or, at any rate, that other seven years would show a larger amount; for Mr. W. Southall, who kindly communicated to me the rainfall as observed by him for the years 1859-1865 at Calthorpe Street, Edgbaston, shows the average of those years to amount to, at least, 32·00 inches, the highest (1860) showing a fall of 37·96, and only 1863 and 1864 showing a less amount than 32·02 inches. This nearly agrees with the statement of another Birmingham observer, Mr. D. Smith, who gives 31·31 as the fall for 1862, while Mr. Southall gives it as 32·86. At Hereford, 16 miles west of Malvern, the rainfall in the same year was only 19·81, as marked by Mr. J. Isbell at the Infirmary of that city. Yet the total of the same year at Malvern, as recorded by Dr. Williams, was 25·70. The Malvern rainfall does, however, appear somewhat in excess of that at Hereford, as Mr. E. J. Isbell (Trans. of Woolhope Club,) sets down 27 inches in 1866, for the latter place, and Dr. Williams gives 28·82 for Malvern the same year.

Mr. Plant's estimate of the average rainfall of the ten years ending 1861 at Birmingham is only 28·42 inches, though he gives 35·66 for 1860. The rainfall of 1861, from his observation, was 29·31 inches; while that of Worcester, as shown at the Observatory (Lat.  $52^{\circ} 12'$  North; Long.  $2^{\circ} 13''$  West; 125 feet above the mean sea level), was 24·87, still giving an excess to the north of more than four inches. The wet autumn of 1866 swells the rainfall of that year at Birmingham to 34·83 inches (Plant), the Malvern fall being 6 inches less, according to Dr. J. Williams.

In the former year (1861) the rainfall at Greenwich was 20·70 inches; at Oxford, 21·32 inches; at Derby, 22·01



inches; at Liverpool, 23·11 inches; and at Alnwick (Northumberland), 31·36 inches. In the south-west, near the sea, the fall was greater, being 37·26 at Clifton, and 37·62 inches at Helston (Cornwall).

I am unable to state the rainfall for this particular year either at Malvern or in the Valley of the Avon. Nor are there at present sufficient materials for arriving at the *average* Malvern rainfall, though Dr. Williams has given me from 1862 to 1866 as under:—

1862—25·70. 1863—21·73. 1864—19·65. 1865—26·81. 1866—28·82.

This, when compared with the Birmingham rainfall shown in the same years, gives an excess of from four to six inches to the latter. If the late Mr. Lawson's estimate of the Hereford rainfall—27·145 inches—was a correct one, the Malvern average would seem to be considerably less than this; but observations are required over a greater number of years than is at present possible.

**VALLEYS OF THE SEVERN AND TEME.**—The late John Williams, Esq., of Pitmaston, near Worcester, who was a careful observer, remarks thus as the result of his experience. "The average fall of rain about Worcester is twenty-seven inches. In wet seasons it amounts to thirty or thirty-one inches; but in dry summers the annual fall does not exceed twenty-two or twenty-three inches."\*

The late Dr. Turley, of the Ivy House, St. John's, Worcester, favoured me with observations, from which it appeared that the average rainfall at Worcester did not exceed 23·50 inches. He recorded the rainfall there in 1853 as 25·95, while at Burford, in the Valley of the Teme, the same year the fall was 25·73, and at Bockleton, in the same valley, 26·40; so that there is a near equality in the rainfall of the Teme and Severn Valleys. Unfortunately the want of recorded observations prevents the fall of rain at Malvern or in the Valley of the Avon being compared with these meteorological notes. According to

\* Williams in Midland Med. Rep. quoted in Hast. Illust. Worcest., p. 124.

observations made by Mr. T. H. Davis, of Orleton, in the Teme Valley, the average of twenty years ending with 1850 was 28·27, so that 1853 given above was rather less than the average.

From a communication made to the *Worcester Herald* by the Hon. George Rushout (now Lord Northwick), of Burford, near Tenbury, it appears that in 1856 the rainfall there was 29·55 inches (5-inch guage), while at Worcester, the same year, Mr. Newell Ellis recorded 29·24 inches as the rainfall at Worcester, thus showing nearly an equality in the rainfall of the Severn and Teme Valleys. This is also shown by the observations of Dr. Turley and Mr. T. H. Davis made in 1852, which shows how variable the rainfall is, and how deceptive an average of a few years only must be. That very wet year the rainfall at St. John's, Worcester, was 40·87, and at Orleton, in the Teme Valley, 45·40.

There is not sufficient data for ascertaining the rainfall in the Avon Division of the county, but it is not probable that it would exceed 27 inches in the year; yet the high Cotteswolde country south of it has a greater amount than this, the observations of Mr. T. C. Brown giving an average fall at Cirencester of 31·4 inches in ten years (1845 to 1854). The rainfall at Cheltenham in 1866 was 30·59 inches, but the autumn of this year was exceptionally wet. Mr. Pitt, in his agricultural works, has roughly estimated the Staffordshire rainfall at 36 inches, which, if correct, would show that county to possess more humidity than the valleys of Worcestershire; but according to a record of four years supplied from the Wrottesley Observatory this would seem too much. Garner, indeed (Nat. Hist. Staffordshire), puts it at 30·59.

Perhaps, after all, the following observations on this subject in the article on "Climate" in Morton's "Cyclopædia of Agriculture" may well deserve to be considered:—"In truth our meteorological tables are mere *approximations* to the actual climatic diversities; while the growth of certain classes of

plants—such as the cereals and the cultivated vegetables, as well as the geographical range of the hop, the vine, the walnut, and many delicate flowering plants—are far more accurate indices of the different climates of Great Britain than our [instrumental] observations.”\*

Practically the botanist will find numerous ponds and marshes become unfitted to maintain their usual occupants in a drought, and others will take their places for a time; while a very wet season will convert marshes into lakes, drowning their plants, and preventing a visitation of their localities till the former state of things is resumed. Sudden inundations help to extend the limits of some species, and by this means the *Anacharis* has been observed to spread over the country, vivifying wherever left in the shallows by the swollen current.

## WINDS AND THEIR EFFECTS.

The effect of prevailing winds as to influencing the size and height of plants has not been much attended to by botanists, although worth recording. On alpine heights *Juniperus nana*, kept down by the rough winds, clings to the rocks like a robe, and so do several of the *Salices*. I have observed the *Asparagus* quite creeping even in fruit on the maritime rocks of Pembroke-shire, entirely from the furious winds that prevail on the coast; and all wanderers on the shore are familiar with the decrepid trees that, bending low to the blast, are urged into an almost horizontal position, looking inland. The narrow axial ridge of the Malvern Hills (north to south) is completely exposed to storms, especially from the west, and the size of the plants growing on or near the crest of the hills is accordingly much affected thereby. In England generally winds prevail from the west and south-west, and this may be said to be the case in Worcestershire, where numerous orchard trees forced upon their

\* R.R. Paper on Climate in “Morton’s Cyclo. of Agriculture.”

knees, or totally prostrate, all *point eastward* as a general fact, showing that the force exerted upon them proceeded from the west.

Plants must be disseminated by the winds to some extent, but it may be a question how far seeds can be carried through the air. M. Alphonse de Candolle has stated that "there does not exist a proved nor even a probable example of a species introduced by natural causes, such as winds."\* But when we see the ruins of castles covered by various plants that have been carried there by natural agency, it is clear that the seeds of some species may be transported for considerable distances, and they may therefore be wafted over seas. *Senecio squalidus* occupied some old walls at Worcester a long time, and the seed was most probably wafted there by the wind from some considerable distance. The appearance of several local orchids, and the changes of locality in ferns,† can only be accounted for by appealing to the aid of the winds. It must, however, be admitted that the transport of plants by man, though unintentionally, is more effective in the present day than the efforts of nature—at least, in known countries.

With regard to climate, influential as that is on a general scale, the slight difference that exists between north, middle, and south Worcestershire does not much affect the growth or diffusion of plants. It does, however, somewhat, for as there is usually a greater rainfall in the north, plants of a sub-alpine character do or have flourished there, not observed, in the Vale of Avon. The Bilberry (*Vaccinium*) grows profusely in North Worcestershire, and formerly the Cranberry; but neither these or any of the *Ericas* are met with in the Vale of Evesham, or on the exposed slopes of the oölitic hills that bound it on the south, where even the *Molinia* is absent.

\* "Tiré des Archives des Sciences," &c., translated in Watson's first Supp. to Cyb. Brit.

† *Ceterach officinarum* is a rare fern in Worcestershire, and only occasionally presents itself in solitary plants. It was pointed out to me early in the present year (1867) as having appeared on an old brick wall in the garden of the Rev. Mr. Rudd, at Kempsey.

## WORCESTERSHIRE COMPARED WITH HEREFORDSHIRE.

I before remarked that with the exception of Salop, so well worked out by the Rev. W. A. Leighton, that none of the other counties bordering on Worcestershire had received sufficient careful attention to allow of the comparison of their plants in numbers or otherwise. By the kindness of Dr. Bull, of Hereford, late President of the Woolhope Club, I have now before me a "Summary of the Geographical Distribution of Plants in Herefordshire," just printed by the Woolhope Club for their Transactions (1867), and drawn up by the Rev. W. H. Purchas. This list is the result of many years labour, and perfect reliance may be placed on the accuracy of Mr. Purchas in his designations of species, but it is much to be regretted that he has cut up Herefordshire into so many districts (14), unless some other botanist could have taken for him those divisions that he could not personally inspect. The consequence is that several of the districts being imperfectly examined, they cannot be compared with each other, as numerous generally distributed plants—*Hyacinthus nonscriptus* (the bluebell), for instance—have no mark as occurring in the Bromyard District, though doubtless there to my knowledge. From this mistake false deductions would be made by reliance on the incomplete lists of districts. Thus it now appears by the Summary that only 26 plants are so general in Herefordshire as to occur in *all* the districts; while excluding those of Bromyard, Frome, and Kington, which are unmarked for some of the commonest plants of Britain, nearly 150 species might be correctly indicated as *general throughout Herefordshire*. Unless districts are very strongly marked by Nature, it is an error to indicate too many, as within a small boundary years of examination are necessary to feel certain that a plant does not grow somewhere within it, while on or near boundary lines the localities of rarer plants may be duplicated. I can therefore only consider the "Summary" of Mr. Purchas as the plants of Herefordshire *generally*.

The total of Phanerogamous plants he has enumerated is 869, but to compare this number with Worcestershire plants, 22 must be subtracted for sub-species or forms of *Rubi*, not taken into account in the Worcestershire Census, and this leaves 847 plants for the present ascertained Flora of Herefordshire, while Worcestershire comprises 970. The list of Mr. Purchas includes 48 plants, which he has *italicised* as naturalized or probably introduced, though all of these would not be accepted in this light by every botanist. The Worcestershire list has 72 certainly introduced plants.

It may be interesting to enumerate such plants as are native to Herefordshire, and are not known as indigenous to Worcestershire, but these are but few, and are as under :—

<i>Ranunculus Dronettii</i> ,* Bab.	<i>Tragopogon porrifolius</i> (1)
——— <i>tricophyllus</i> , Fries	<i>Hieracium pallidum</i> (1)
<i>Trollius europæus</i>	——— <i>lasiophyllum</i> (1)
<i>Hutchinsia petræa</i> (1)	——— <i>gothicum</i> (1)
<i>Arabis hirsuta</i>	<i>Arotium tomentosum</i> , Pers.
<i>Silene noctiflora</i> (1)	<i>Wahlenbergia hederacea</i> (1)
<i>Cerastium tetrandrum</i> , Curt. (1)	<i>Vaccinium Vitis Idæa</i> (1)
<i>Prunus Padus</i>	<i>Polemonium cæruleum</i> (1)
<i>Pyrus scandica</i> , Bab.	<i>Empetrum nigrum</i> (1)
<i>Callitriche platycarpa</i> (1)	<i>Mercurialis annua</i> (1)
——— <i>pedunculata</i> (1)	<i>Salix nigricans</i> (1)
<i>Sedum Forsterianum</i> (1)	<i>Allium schœnoprasum</i> (1)
<i>Saxifraga hypnoides</i> (1)	<i>Juncus diffusus</i>
<i>Rubia peregrina</i> (1)	<i>Luzula Borreri</i> , Brom. (2)
<i>Fedia Auricula</i> (2)	<i>Carex humilis</i> (1)

The figures show the plants as only growing in one or two of the Herefordshire districts.

The Black Mountain bordering on Wales, and the rocks of carboniferous limestone that margin the course of the Wye, give Herefordshire a few plants not possessed by Worcestershire, and Mr. Purchas has also appropriated a few critical *Hieracia*. I must also remark, that on the western border of Worcestershire, and on the Malvern Hills, which I have considered fairly belonging to Worcestershire, I have catalogued a

\* The *R. Aquatilis* of my Worcestershire list may possibly include this form and *R. tricophyllum* also, but I could not work them out in the Worcestershire districts, and am willing to credit Mr. Purchas with them, though he gives but *one certain locality*.

few rare species taken also by Mr. Purchas, though the localities are the same. This could hardly be avoided, but I believe it only particularly concerns *Rosa Doniana*, *Centunculus minimus*, and *Epipogium aphyllum*, which are within the Herefordshire border line, but the latter plant, as I am informed by the Rev. Gregory Smith, Rector of Tedstone-de-la-mere, only appeared one season, and has never since been met with. Herefordshire possesses twenty-four Ferns, two of which are unknown in Worcestershire, viz., *Polypodium Phegopteris* and *Lastrea Fenisceci*. It has only two *Lycopodia*—*L. clavatum* and *Selago*, and six *Equisetæ*.

As a balance to the plants noticed by Mr. Purchas in Herefordshire, and as yet unobserved in Worcestershire, the following remarkable species may be placed as not recorded in Herefordshire :—

*Thalictrum minus*  
*Anemone pulsatilla* (1)  
*Myosurus minimus*  
*Delphinium Consolida*  
*Hesperis matronalis*  
*Turritis glabra*  
*Thlaspi perfoliatum* (1)  
*Teesdalia nudicaulis*  
*Lepidium Draba* (1)  
 ——— *ruderales*  
*Isatis tinctoria* (1)  
*Reseda lutea*  
*Viola palustris*  
*Parnassia palustris*  
*Sagina ciliata* (1)  
*Alsine tennifolia* (2)  
*Geranium sylvaticum*  
 ——— *rotundifolium*  
*Radiola millegrana*  
*Medicago maculata*  
*Trifolium ochroleucum* (1)  
*Astragalus hypoglottis* (1)  
*Vicia bithynica*  
 ——— *lathyroides* (2)  
*Lathyrus Aphaca*  
 ——— *Nissolia*  
 ——— *palustris* (1)  
*Rubus saxatilis* (1)  
*Pyrus domestica* (1)  
*Lythrum Hyssopifolia* (1)  
*Myriophyllum alterniflorum*

*Lepigonum medium*  
*Apium graveolens*  
*Bupleurum tenuissimum* (2)  
 ——— *rotundifolium*  
*Cenanthe pimpinelloides*  
*Caucalis daucoides*  
*Smyrnum Olusatrum*  
*Asperula cynanchica* (1)  
*Galium tricornes*  
*Hypochaeris glabra* (2)  
*Lactuca Scariola* (1)  
*Campanula glomerata*  
*Pyrola media*  
*Gentiana campestris* (1)  
*Villarsia nymphaeoides* (1)  
*Cuscuta europæa*  
*Cynoglossum montanum*  
*Verbascum Lychnitis*  
*Mentha Pulegium*  
*Calamintha Acinos*  
*Scutellaria minor*  
*Hottonia palustris*  
*Glaux maritima*  
*Samolus Valerandi*  
*Atriplex Babingtonii*  
*Polygonum minus* (1)  
*Rumex maritimus*  
 ——— *palustris*  
 ——— *pulcher* (3)  
*Euphorbia platyphylla* (1)  
*Ceratophyllum submersum*

Hydrocharis Morsus-ranae  
 Spiranthes cœstivalis (1)  
 Epipactis media  
 Ornithogalum umbellatum  
 Tulipa sylvestris (2)  
 Allium oleraceum  
 Narthecium ossifragum

Actinocarpus Damasonium (2)  
 Acorus Calamus  
 Rhynchospora alba  
 Carex elongata (1)  
 ——— curta  
 ——— stricta  
 Lolium temulentum.

Nor are these all the plants that occur in Worcestershire, but are absent from the "Summary" of Mr. Purchas, though Hereford is united with Worcester and Warwick as a sub-province by Mr. Watson. Worcester and Warwick associate very well, but Monmouthshire, as a continuation of the valley of the Wye, would be better joined to Hereford. The wider and flatter valley of the Severn, with more of marshy ground no doubt gives Worcester an advantage over Hereford, though probably closer research by various members of the Woolhope Club would increase the Flora of Herefordshire beyond its present apparent amount.

One concluding remark may be made as to the influence exercised by climate upon the vegetation of a country. It has been advisedly stated by eminent palæontological observers, that geological records show that the species of epochs long past were not the same as those of the present time; and Mr. H. C. Watson remarks in his *Cybele Britannica*, "consequently, so far as the future can be inferred from the past, the present species will in their turn give place to different species of the future." But this conclusion cannot fairly be inferred without the special ingredient that the geologist insists upon. I cannot here enter upon Mr. Darwin's "Origin of Species," which would require a separate treatise to discuss. But the geologist shows that if in remote epochs the plants of countries "were not the same as those of the present time," that the *climatés* also were not the same. We are told of a "Glacial Epoch," when the climate of Europe was generally much colder than it is now; and a preceding "Miocene" period, when under warmer influences, plants flourished in Europe that are at present restricted to southern latitudes. So doubtless now, if any cosmical changes really permanently altered the climate of



England or Europe generally 30° or 40°, one way or other, some plants might perish, and others that could not at a low temperature live all the year round in the open air would find a home. But we have no ground to believe in a future change of species of plants unless the average temperature of the country be itself changed. Daisies will be daisies still ten thousand years hence and remain in our meadows unless the climate of England alters, for it is not the plants themselves that can be proved to have changed, but the *climate*, or circumstances that required other plants than those that we see now indigenous around us. Whatever changes Nature may make in what we call species, are tardy beyond human observation, for Lyell has adduced an instance of aquatic plants preserved in a bog at Cromer, Norfolk, which were recognized as the same as those growing in morasses of the present day. Yet this peat at Cromer, in which the plants had been preserved, was estimated to have been deposited 100,000 years ago.\* If it has only existed half that time, any supposed changes made by Nature in species are out of the limit of observation, and the alterations that man effects cannot safely be left for Nature to continue, and the gifts of horticulture retrograde or disappear when left to themselves. Climate and altitude, however, are acknowledged constants on which the distribution of vegetation rests, and would govern the appearance of plants that sought to colonize the British Islands again, if it was possible for any extreme cold or temporary submergence to destroy every thing having life upon our soil. These remarks in connection with the list of Worcestershire plants and their frequent or rare occurrence, may be appropriately closed with the following extract, which well deserves thoughtful consideration :—

“To the phyto-geographer the commonest plants can remain sources of interest and objects of research, indirectly through their localities and ranges, equally with the rarest kinds, in searching for which botanical collectors evince so much ardour.

\* See Sir Charles Lyell's volume on the “Antiquity of Man.”

The thoughtful observer of Nature takes longer and deeper views. He seeks an answer to the question, whether those inequalities of rarity and frequency, of wide and restricted distribution, are simply fortuitous?—whether they are related by causation or otherwise to known differences in the present physical geography of the island? More than this, he may extend his investigations so far as to seek out other and remote explanations, drawn from ascertained facts and probabilities in the past history of the earth, or of Britain by itself; with less remote explanations, traceable through the history of human operations within Britain.”\*

\* Watson's *Cybele*, iv., p. 489.

## WORCESTERSHIRE BOTANISTS AND BOTANICAL AUTHORS.

The first botanical writer locally connected with Worcestershire appears to have been Mr. Edmund Pitts, an Alderman (and probably medical practitioner) of Worcester, who sent an account of the old Sorb-tree (*Pyrus domestica*) in Wyre Forest to the Royal Society, which was inserted in the Philosophical Transactions for 1678. Mr. Pitts is further stated, in *Magna Britannia*, to have found "the lesser green-leaved Houndstongue, growing in some shady green lanes near Worcester;" but no further list of his discoveries has come to light. In 1786 the celebrated "Botanical Arrangement of British Plants," by Dr. Withering, appeared. As that gentleman resided at Edgbaston Hall, near Birmingham, close on the borders of this county, many references are made to Worcestershire plants, especially in the improved second edition, which came out in 1787, under the co-editorship of Dr. Jonathan Stokes. This edition well merits the attention of the Worcestershire botanist, as Dr. Stokes then resided at Kidderminster, and various interesting localities of the rarer plants of the county are mentioned. In his time Birmingham Heath, Winson Green, Moseley Wake Green, and other waste places near Birmingham and in or close to this county, produced such plants as *Eriophorum vaginatum*, *Parnassia palustris*, *Hypericum elodes*, *Narthecium ossifragum*, &c., now lost by drainage and cultivation. Mr. Ballard, a surgeon, at Hanley Castle, near Malvern, is frequently cited as an authority for rare Worcestershire species by Withering, and is stated to have found *Dianthus prolifer* in a marl pit on Lindridge Hill, Hanley.\* Dr. Stokes also himself supplied various localities for plants, but he afterwards removed to

\* The *Dianthus prolifer* has in modern times been vainly sought at Hanley.

Chesterfield, and practised there till his death in 1831, in the 77th year of his age.\*

Dr. Nash, when he published his ponderous folios on the history of the county, prefixed a list of remarkable plants, many of which are no longer to be found at the places there indicated. To whom he was indebted for this catalogue of plants he does not inform his readers. Pitt, in his "Agriculture of Worcestershire," published in 1810, gives rather a long list of vegetable productions, which he observed, he says, "in a tour through the county in September and October, 1805."

Next follows Mr. Thomas Purton, who was a surgeon, at Alcester, and published a "Midland Flora" (in two vols.), in 1817. Worcestershire was included in his field of observation, and he received assistance from the Rev. W. S. Rufford, of Badsey, near Evesham, and Mr. W. Scott, of Stourbridge. Purton particularly refers to the plants of Feckenham Bog, which has been drained since he wrote and observed. He published an Appendix to his Flora in 1821, containing many additional flowering plants and more cryptogamous, with various plates of Fungi. Sir J. E. Smith lauded Purton as "accurate," and probably few of his designations are wrong, though so many changes have occurred in the country since his time that

\* In the "Worcestershire Miscellany" (Supplement, 1831), is the following curious note in reference to the death of Dr. Stokes, and a plant recorded by him as growing at Worcester, where he once resided:—"Till the last year (1830) the *Scandix cerefolium* grew as recorded by Dr. Stokes, 'in considerable plenty, in the hedge on the south-west side of the Bristol road, just beyond the turnpike.' Those Vandals (as respects botanists), the Road Surveyors, last year altered the course of the Bristol road, cut the bank away where the *Scandix* grew, and not even a stray plant is now to be met with there. Coincidences sometimes force themselves upon our notice; had any one told Dr. Stokes that the removal of the plant he found in 'May, 1775,' would predicate his own removal from this mortal life, he would surely have smiled. Yet mark, this *Scandix cerefolium* grew unmolested in its habitat, as first remarked by Dr. Stokes, from May, 1775, to May, 1830. In the latter year the road was altered, and the plant eradicated, so that in May, 1831, it could be no longer found in its old home, and *that same month and year* was Dr. Stokes gathered to his fathers." The year previous to his death he published the first volume of a work entitled "Botanical Commentaries," the result of fifty years' observations and study. He made extensive collections of plants, which were sold and dispersed after his death.

many plants are now lost at the localities then assigned them. One of his correspondents, Mrs. Gardner, mentions *Silene anglica*, as found at Areley, near Stourport, but no observer has since met with it. Purton's work is still valuable for its enumeration of cryptogamous plants. Mr. Purton died in 1833, and his executors presented his Herbarium to the Worcestershire Natural History Society, but no use has been made of it, and I fear most of the plants in it are now ruined.

Other notices of Worcestershire plants may be found in Turner and Dillwyn's "Botanical Guide through England and Wales;"\* Laird's Topography of Worcestershire in the "Beauties of England and Wales;" Walford's "Scientific Tourist through Great Britain;" Ambrose Florence's "Worcester Guide;" and Loudon's "Magazine of Natural History," to which periodical I sent a list of Malvern plants, afterwards enlarged and published as "The Botany of the Malvern Hills." There is a considerable list of "Remarkable and Interesting Plants indigenous to Worcestershire," appended to the "Illustrations of the Natural History of Worcestershire," by the late Sir Charles Hastings, M.D., for which, however, I am responsible, though the late Dr. Streeten, of Worcester, supplied some of the localities. Mr. T. Baxter also drew up a list of the more interesting plants around Worcester, which appeared in Stanley's "Guide to Worcester and Malvern."

I am not aware of any living local botanists out of the Club, who have paid much attention to the plants of the county, except Miss Moseley, of Malvern, who possesses an unrivalled collection of original drawings of British plants from her own delicate and accurate pencil, and I have been indebted to her for several stations of plants in the Malvern district. Dr. Addison, when residing at Malvern, was careful to notice all the plants in his vicinity, as appears in his "Medical Topo-

\* The "New Botanists' Guide," edited by Mr. H. C. Watson, contained a list of the presumed rarer plants of Worcestershire as contrasted with other counties. In the list then given with limited experience, were a few errors of designation not perpetuated in the present essay.





THE SORB-TREE (*Pyrus domestica*, Sm.),

As growing in Wyre Forest, Worcestershire, 1856. Described in the Philosophical Transactions for 1678, and then considered an old tree.

Destroyed by fire, in 1862.

graphy of Malvern." The gentlemen in the Club who have paid particular attention to our native plants and looked after them with zeal, are the Rev. Dr. Cradock, formerly President of the Club, and now Principal of Brazenose College, Oxford; Mr. W. Mathews, jun., A.M., of Birmingham, our late talented Secretary; the Rev. J. H. Thompson, Incumbent of Cradley; Mr. T. Baxter, F.G.S., Second Master of the Cathedral School; Mr. Thomas Westcombe, of Worcester; and Dr. Fraser, of Wolverhampton. In connection with Bewdley and Wyre Forest, Mr. George Jordan merits high commendation as an untired explorer and guide for many years, and still at the great age of 85, retaining much botanical zeal. While his strength allowed he was ever ready to lead the way to the purlieus of the forest, and as a fine-nosed herbalist, he was rarely at fault on his favourite ground. Having many times guided the Club and its members to the time-honoured though decrepid Sorb-tree (*Pyrus domestica*), which he regarded with almost filial love, its wanton destruction by ruffian hands was a source of much grief to him, and he gathered up with decent care the relics that were left of the limbs of the old veteran, some of which he yet retains. (*See sketch of the tree in its last stage of decay.*) Mr. Jordan brought a flowering branch of the Sorb-tree to the great meeting of Naturalists at Malvern, in June, 1855. Mr. T. W. Gissing, now living at Wakefield, may also be mentioned as a botanist who well explored the vicinity of Worcester when residing among us, and is a witness to the finding of *Spiranthes æstivalis* in Wyre Forest.

The late Dr. W. Ick published a list of "Remarkable Plants growing in the vicinity of Birmingham," in the Analyst for 1837. As these plants, including those of Moseley and Yardley, in Worcestershire, were preserved in his Herbarium, which I have seen, I have made use of his researches, and many of the plants he records I have myself observed at Moseley, guided there in pleasant excursions by my friends, Mr. W. Mathews, jun., and Dr. J. H. Blount.





ON THE  
LOCAL DISTRIBUTION  
OF THE  
PLANTS OF WORCESTERSHIRE,  
&c., &c.

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IN drawing up this Essay as a summary of the operations of our Club in the field of observation since it was first formed, I have considered that the treatment of a particular subject would be better and more useful to ourselves and the lovers of Natural History, than a diffuse address on various points that had not been worked out.

Hitherto the Club has not published, on its own account any observations made by its members, though our "transactions" in the field have been faithfully recorded by the Press in Worcester, and thus an interest has been kept up in the incidents of our traverses, that has no doubt tended to maintain, as well as increase, our members. I shall now proceed with the work assigned me, and with at least the earnest ardour that should ever animate a devoted lover of nature, give a detailed account of the plan we have pursued, and the successful result of our explorations in the particular course we have had in view.

The Club was established, though quite in a quiet way, in 1847, and from the first received the most zealous and efficient aid of our Honorary Secretary, my ardent and active friend, William Mathews, jun., Esq., M.A., F.G.S., without whose continued co-operation we could scarcely have held together under the vicissitudes that change of residence, and even the grim spoiler—death—has made in our ranks since we first met together to investigate the stores of Nature.

As a Naturalists' Club, it is our duty to investigate every branch that falls within the scope of Natural History; but as diffuseness of operations might, from their very extensiveness,

lead to no practical result, it was determined, in the first place, to direct our energies to the completion of the Flora of the County, and its division into Botanical Districts, with assigned boundaries, each of which in its geological features should present salient distinctive marks of observation, which the plants found in each division might, by their frequency or otherwise, bear witness to as indigenous to the soil, and so be compared with each other. I will first notice these primary Botanical Divisions, mention the most remarkable spots we have visited in them, and then record the discoveries made by our members, or the additional localities found for rare or remarkable plants. The great advantage of discovering plants in company is, that nothing is left to the mere recollection of an individual—the fresh specimen is seen and examined by many critical eyes, and the species and the spot where it grew is marked with unerring certainty.

The Botanical Districts into which we have proposed to divide the County of Worcester are :—

1st.—THE SEVERN VALLEY.

2nd.—THE MALVERN HILLS AND VALLEY OF THE TEME.

3rd.—THE AVON AND LIAS COUNTRY.

4th.—BROMSGROVE LICKEY, and the intervening district to Birmingham, Halesowen, Stourbridge, and Dudley.

Considerable difficulty presents itself with respect to the external boundaries of all the divisions, and we have felt inclined to take in or enclose for botanical purposes, portions of the adjacent counties which really *geographically* belong to us, as peninsular parts of Herefordshire and Gloucestershire, the Clent Hills, &c., while we would willingly give up such a distant quasi-island as Shipston-on-Stour, near Stratford-on-Avon, and exchange with Gloucestershire such petty isolations as Evenlode, Iccombe, Dalesford, and Cuddesden, so far to the south. On such debateable ground it is often dubious in which county a rare plant is located, and a station becomes duplicated by its reference to different counties, according as “the wish is father to the thought”—and hope of the observer.

But not to discuss this point farther at present, I shall only now advert to the particular and interesting spots where we

have held our meetings in the different divisions. We must all have felt that keenness of delight which the prospect of adventure gives to any ramble, and in the freshness of the vernal breeze, the beauty of waving woods in their richest load of leafy verdure, the scent of flowers opening fully to the glowing sun, and even in apparently barren heathy wastes, grey with *Sphagnum* and the *Reindeer Lichen*, have found pictures for future reference imprinted upon the mind, which well repaid our journeys and pedestrian toils, independent of important discoveries that might be made by close research.

Our own "sandy-bottomed Severn," if turbid at times, and not very broad in its reaches, has yet its peculiar beauties, where, as at Redstone and Blackstone, craggy tufted rocks, once sanctified by eremitic cells, shade its glittering stream in the noon-tide hour. Botanical research gives an additional zest to these hallowed spots by the discovery of the dark-flowered *Geranium phæum*\* on the former broken rocks, and the pretty Maiden Pink (*Dianthus deltoides*) on the steep crest of the latter. The character of the once swift-flowing river is now lost between Lincombe and Worcester, but near Ribbesford and Bewdley, where it is as yet uninvasioned by Navigation Commissions, its shallows in early summer are resplendent with the numerous silver flowers of the *Water-Crowfoot* (*Ranunculus fluitans*). The golden aspect of the Severn meadows in May and June, from unnumbered Buttercups, is exciting to an artistic eye; and the banks, yellow-fringed by the crowded discs of the Tansy in August are scarcely less glowing, while in many places broad spreads of pale purple decorate the declining year, from the naked flowers of the *Colchicum autumnale*. The crowded yellow

\* As cottagers now inhabit the recesses of the precipice once occupied by the hermit, and bits of garden are cultivated on the declivity of Redstone Rock, a doubt may exist as to the origin of *Geranium phæum* here; but I saw no plants of it in the untidy plots at the base, and as *Saxifraga granulata* also grows plentifully about, I should consider both "truly wild," unless indeed they may be placed to the account of the "reverend hermit" who once occupied the solitary spot. Besides my own observation, when visiting the spot, Mr. Kenrick Watson, who gave a list of the wild plants around Stourport in a fasciculus published by the Worcestershire Natural History Society, includes *Geranium phæum*, so that it must have been persistent here for some time.

clusters of the *Nasturtium sylvestre* also in the summer-time give a local colouring to the banks of the river.

### I.—THE SEVERN VALLEY.

This division extends from North to South through the whole County, a distance of about thirty miles; but below Worcester and the junction of the Teme, is confined to the narrow tract extending from its Eastern bank to the Lias hills, that at Ripple and Bushley gradually approach to it. The *Western* side of the valley, below Worcester, has been attached to the Malvern district, on account of its being included in my "BOTANY OF THE MALVERN HILLS."

The first locality to be mentioned in this division is that of *Wyre Forest*, near Bewdley, its eastern confines extending to the banks of the Severn. The "forest" extends over a considerable tract of country, whose fundamental rock is the old red sandstone; and Dowles Brook, flowing through it, is the boundary between this county and Salop. The woodlands are chiefly made up of Oak,\* but in the bordering coppices is a considerable sprinkling of the Lime (*Tilia Europæa* and *parvifolia*), which appears truly indigenous; here and there are also some trees of *T. grandifolia*. A few Yews (*Taxus baccata*),† are scattered among the other trees, as well as Holly (*Ilex aquifolia*), Hazel (*Corylus avellana*), Birch (*Betulus alba*), the Service (*Pyrus torminalis*), and occasional clumps of *Pyrus aucuparia*. *Rhamnus frangula* is very abundant in the moister parts of the forest. The club held a meeting here in July, 1853, and made a special inspection of the old "Sorb Tree" (*Pyrus domestica*), which has been celebrated in botanical works as the only apparently wild tree of the species in Britain. It was mentioned in the Philosophical Transactions for 1678, by Alderman Pitts, of Worcester, and was

\* *Quercus intermedia* seems to predominate.

† A few years since a botanical curiosity existed near Heighington, called and marked in the Ordnance Map "*The Yew-in-the-Oak*," being a fine young yew-tree, that having originally vegetated as a seedling on a pollard oak, had extended its roots to the ground, and so filled up the hollow cavity of its foster mother. Thus for many years the two trees grew in close proximity, the yew, however, gradually breaking away from, and disrupting the yielding bark of the oak, until a fierce hurricane of wind, in 1845, entirely prostrated the yew.



**THE SORB-TREE (*Pyrus domestica*) OF WYRE FOREST,  
WORCESTERSHIRE, before its lower branches were denuded.**

*From a sketch taken many years ago.*

...the river ...

...VALLEY.

The ... through the whole ... Worcester ... narrow tract ... at ... side of ... Malvern ... ROTARY OF ...

... is that of ... to the ... considerable ... boundary ... made ... considerable ... which ... there are also some trees of ... are scattered ... (the *ayusfolia*), Hazel ... the Service (*Pyrus* ... *Rhamnus* ... of the forest ... a species ... which has ... recently added tree ... in the Philosophical ... of Worcester, and was



THE SORREL-TREE (*Pyrus domestica*) OF WYRE FOREST.  
 Worcester ... before its lower branches were denuded.  
 ... The Tree is the Oak, being a fine ... a small ... hollow ... two ... gradually ... 1840

considered an old tree at that time. At our visit it was in a very decrepid state, with lank, bare, and lofty branches, and only exhibited vitality at its very summit. Very little fruit was then produced, and the Sorb-tree presented the scraggy and decrepid aspect shown in the annexed woodcut. This venerated sylvan monument, which, left only to Nature's care, might have existed for centuries longer, was mischievously burned down in 1862.\*

In the glades of the forest, various plants grow not to be found in other parts of Worcestershire, as *Thalictrum minus*, *Pyrola media*, and *minor*, *Rubus saxatilis*, *Geranium sylvaticum*, *Spiranthes æstivalis*, *Epipactis palustris*, and *Equisetum hyemale*. *Epipactis ensifolia* also grows here in some seasons in great profusion. On the occasion above adverted to, *Gentiana campestris* was added to the Flora of Worcestershire, and *Coronilla varia* observed growing naturalized on the banks of the Severn. In a great bog on the banks of Dowles Brook, *Eriophorum latifolium* grows in profusion, as well as a considerable quantity of *Carex fulva*. *Doronicum Pardalianches* once grew below Winterdyne, but I fear it is now lost there. Numerous *Rubi* abound in the forest, among which may be mentioned a very fine sub-erect variety of *Rubus Lejeunei*, (*glandulosus*, Bab.) with a beautiful bloomy stem, meriting a particular designation. There is also a very leafy form that I have described in the Botany of the Malvern Hills, as *Rubus pampinosus*. Nor are these all the rarities the forest affords, as the following list will show, for which I am indebted to

\* Dr. Plott mentions the Sorb Tree rather loosely, as occurring in "the moorlands of Staffordshire," but as no other tree has ever been observed there, it is highly probable that the old tree in Wyre Forest was what he had heard of, and a portion of Staffordshire, viz., Upper Arely, approaches very near. But I am inclined to the opinion that this tree was brought over from Aquitaine, and planted beside a hermitage in the forest by some recluse, who was visited by those who venerated the tree for its protective powers. I was assured by an inhabitant of the vicinity, that the hard fruit of the Sorb was formerly hung up in cottages as a protection from "the witch," and even now the idea of its virtues has not quite died away. Its relationship to the mountain ash, still superstitiously regarded in Scotland, renders it likely that this tree should be considered equally, if not more powerful, as a charm against witchery. A mound of stones, now overgrown with brambles, may be noticed by close inspection near the tree, probably the remains of the Hermitage—for many existed previous to the Reformation in the north of Worcestershire. The Hermit, perhaps, had a garden, for the privet and the *Prunus domestica* grow close by, though I did not see them elsewhere in the forest.



*Mr. George Jordan*, a venerable exploring botanist long resident in Bewdley, and ever ready to give information as to the plants on his favourite ground. Many of these, but not all, have been confirmed by Mr. W. Matthews and myself.

PLANTS OF WYRE FOREST AND THE VICINITY OF BEWDLEY.

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|---|--|
| <p><i>Hippuris vulgaris</i>, at Uncless<br/> <i>Fraxinus excelsior</i>, var. <i>heterophylla</i>, Sandbourne<br/> <i>Eriophorum polystachion</i> ——— latifolium<br/> <i>Melica nutans</i>, in damp shady places<br/> <i>Molinia cærulea</i>, abundant<br/> <i>Sanguisorba officinalis</i><br/> <i>Mœnchia erecta</i>, near Spring Grove<br/> <i>Myosotis sylvatica</i>, at Bridewell<br/> <i>Hyosciamus niger</i>, near Pensax<br/> <i>Campanula patula</i><br/> <i>Lonicera caprifolium</i>, Bridewell<br/> <i>Gentiana Amarella</i>, at Trimpey<br/> <i>Gentiana campestris</i><br/> <i>Pimpinella magna</i><br/> <i>Convallaria majalis</i><br/> <i>Allium oleraceum</i> ——— vineale<br/> <i>Ornithogalum umbellatum</i><br/> <i>O. nutans</i><br/> <i>Narthecium ossifragum</i>, Leigh-head, Rock Parish, in a wood<br/> <i>Tulipa sylvestris</i><br/> <i>Triglochin palustre</i><br/> <i>Epilobium angustifolium</i><br/> <i>E. angust. macrocarpum</i>, at Bridewell<br/> <i>Polygonum Bistorta</i><br/> <i>Monotropa Hypopitys</i>, on Warshill<br/> <i>Pyrola media</i> ——— minor<br/> <i>Saponaria officinalis</i><br/> <i>Sedum Telephium</i> ——— dasyphyllum<br/> <i>Prunus insititia</i><br/> <i>Cerasus austera</i> ——— avium<br/> <i>Spiræa salicifolia</i>, on the banks of Dowles brook, naturalized<br/> <i>Rosa spinosissima</i><br/> —— Sabini, very rare<br/> <i>R. villosa, tomentosa, rubiginosa</i> and <i>inodora</i><br/> <i>Rubus</i> "glandulosus," <i>hirtus, pallidus, fuscus, Guntheri, radula, rudis, amplifolius, pampinosus, villicaulis, vestitus, cordifolius, affinis, Lind-leianus, sub-erectus, and saxatilis</i></p> | <p><i>Aquilegia vulgaris</i>, from Furnace Coppice to Bewdley<br/> <i>Thalictrum minus</i><br/> <i>Origanum vulgare</i><br/> <i>Mentha sylvestris, rotundifolia, viridis, piperita, gentilis, agrestis</i>, and <i>Pulegium</i><br/> <i>Acinos vulgaris</i>, Warshill<br/> <i>Scutellaria minor</i><br/> <i>Lathræa squamaria</i><br/> <i>Pedicularis palustris</i>, in Furnace Coppice<br/> <i>Orobanche major</i>, on Warshill<br/> <i>Cardamine amara</i> and <i>impatiens</i><br/> <i>Geranium sylvaticum, sanguineum, Pyrenaicum, and lucidum</i><br/> <i>Corydalis claviculata</i>, at Winterdyne<br/> <i>Orobis tenuifolia</i><br/> <i>Vicia sylvatica</i><br/> <i>Astragalus glycyphyllos</i><br/> <i>Hypericum montanum</i> and <i>dubium</i><br/> <i>Doronicum Pardalianches</i>. Below Winterdyne, sparingly<br/> <i>Hieracium umbellatum</i> and <i>boreale</i><br/> <i>Gnaphalium margaritaceum</i>, in a copse near Park Farm<br/> <i>Gnaphalium sylvaticum</i><br/> <i>Erigeron acris</i><br/> <i>Anthemis nobilis</i>, on a common at Bliss Gate<br/> <i>Gymnadenia conopsea</i><br/> <i>Habenaria viridis</i><br/> <i>Listera nidus-avis</i><br/> <i>Neottia spiralis</i><br/> <i>Epipactis latifolia</i> ——— ensifolia ——— palustris<br/> <i>Amaranthus blitum</i><br/> <i>Carex pulicaris, pallescens, fulva, pendula, Pseudo-cyperus</i><br/> <i>Juniperus communis</i>, in Furnace and Sturt's Coppice<br/> <i>Botrychium Lunaria</i>, on Warshill<br/> <i>Lycopodium clavatum, Winterdyne</i><br/> <i>Equisetum Telmateia, sylvaticum, and hyemale</i>. <i>E. sylv.</i> is plentiful between Bewdley and Kidderminster</p> |
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Mr. Jordan, at a meeting held at Areley, in 1848, called the attention of the club to a variety of the *Thymus Serpyllum*, which he considers distinct, and thus discriminates:—"It hath a powerful scent, similar to oil of origanum, tastes very pungent, and comes into bloom in July, a month later than the type of *Serpyllum*. It grows in stiff soils where the latter cannot exist, and is always larger in its parts." The two plants, Mr. Jordan says, appear different when growing together, and after cultivating them for six years, and raising them from seed, each still preserved the characteristic of its parent. *T. Serpyllum*, Mr. Jordan observes, "hath a slight lemony smell, very little taste, and comes into bloom early in June, always a month sooner than the other." This last may be *T. Chamædrys*, Fries.

Mr. Babington has now made two species of our British Thymes, but I am uncertain whether or not they accord with the suggestions of Jordan. In true *T. Serpyllum* the *ascending capitate flowering stems* are distinct from the hairy prostrate creeping stems. Mr. J. G. Baker, of Thirsk, has recently distinguished forms of *T. Serpyllum* and *T. Chamædrys* as growing in North Yorkshire, and states the flowers of the first as "mostly in a terminal head," and the "leaves narrower and narrowed more gradually, the lower-half fringed with hairs." *T. Chamædrys* has the flowers usually with one or two separated whorls, and "leaves broader in proportion to their length."

Two introduced plants are now naturalized about Bewdley, according to Mr. Jordan, and grow in considerable profusion: viz., *Lunaria annua*, and *Nicotiana rustica*. The latter was probably cultivated here soon after the introduction of Tobacco from America. Mr. R. C. Warde, of Kidderminster, has in his possession a MS. Note Book by Henry Townshend, Esq., of Elmley Lovett, in which it is stated, that in July, 1662, by Letters from the Lords of Council, it was commanded "that all Tobacco planted within the Countie of Worcester should be speedily destroyed, by order of the Sheriff and Justices of Peace to whom ye said letters were directed."

It should be stated, that although *Geranium sanguineum* is rather plentiful in the forest on the Shropshire side of Dowles

Brook, and Mr. Jordan has been familiar with it for many years, yet, he observes, that scarcely a stray plant ever gets on the Worcestershire side of the brook. This county has, therefore, hardly a colourable claim to the plant.

Though *Spiræa salicifolia* certainly now grows upon the banks of Dowles Brook, yet it cannot be considered as indigenous there, and has probably been planted many years ago. *Antennaria margaritacea*, though noticed by the Rev. T. Butt as growing in the forest many years since, and communicated by him to the late Sir J. E. Smith, is perhaps in the same predicament.

Ribbesford Wood has been planted in several places with the Beech (*Fagus sylvatica*), and the Sweet Chestnut (*Castanea vulgaris*), but they are *nowhere indigenous to Worcestershire*.

A few interesting Mosses have been noticed in moist and shadowy glens about Bewdley, and doubtless many might be discovered by an industrious resident in the vicinity. The *Sphagnum acutifolium* abounds in the boggy parts of the forest, where also the Fountain Apple-Moss (*Bartramia fontana*) flourishes. I have also received *Hookeria lucens* as growing in "the Golden Vale" near Bewdley, and as far as I know it has not been gathered elsewhere in Worcestershire. The *Funaria hygrometrica* forms wide patches wherever charcoal has been burned.

Among the Fungals of Wyre Forest, *Boletus edulis* and *Geaster rufescens* may be mentioned; and the splendid vermillion *Thelephora carbonaria* revels on the old charcoal heaps, in company with *Polyporus perennis*; while *Marchantia polymorpha*, with its remarkable barren and fertile receptacles, delights to extend itself in the same grimy spots.

### HABBERLEY VALLEY.

Habberley Valley, about two miles north-west of Kidderminster, is a highly interesting spot, being a deep excavation in the new red sandstone, which is stated by Professor Buckman in his "Ancient Straits of Malvern" to have been in old times an inlet of the Severn Sea. The bare pointed mass of sandstone

rock in its centre called "the Pecket," near "the Giant's Grave," has a very remarkable appearance, and seems to suggest its having been once an islet washed around by the waves. Although the Club have not hitherto held a meeting at this romantic spot, yet it has been well explored by our active Secretary (Mr. W. Mathews) and myself, on several occasions. On the isolated "Pecket" rock *Cotyledon umbilicus* flourishes, not at all a common plant in the county; and in the vicinity we gathered *Erodium maritimum* among loose stones. The prospect from the Pecket of the opposite precipitous bank of the bay, now bush-covered and overgrown, is very pretty. In the sandy fields about Habberley, the *Verbascum virgatum* grows, the only locality in Worcestershire where it can be considered indigenous; and in 1851 we noticed here the *Botrychium lunaria* (Moonwort) in considerable plenty, growing very fine among wastes of Brake (*Pteris aquilina*), now unfortunately for the botanist under process of cultivation.

The sandy district around Kidderminster maintains several species of plants delighting in such a soil, as *Turritis glabra*, *Verbascum nigrum*, *Rosa spinosissima*, and *Gnaphalium sylvaticum*. Various pools are excavated in the ravines that lie at the bases of the sandstone hills, where *Carex paniculata* in some places forms by its long-continued growth enormous hussocks. *Rubus sub-erectus*, rather rare in Worcestershire, may be noted on the borders of these retired pools, with other marsh-loving plants. Ferns of the genus *Lastræa* here grow very luxuriantly, and most puzzling varieties occur intermediate apparently between *Lastræa spinulosa* and *dilatata*.

At Cookley, in the same district, the *Osmunda regalis* was for the first time discovered by Mrs. Bennett Williams, of Worcester, in 1852, which reflects much credit upon her research, for no botanist had previously met with it here. However, not long afterwards, Mr. W. Mathews gathered the same fern in a hedge at Fenny Rough, near Kidderminster—thus only beaten "by a neck"—and that one of a lady! Previously Moseley Common had been the only Worcestershire locality for the stately *Osmunda*,

and even there it was supposed to have been lost by the enclosure of the waste, though I have received information that it yet exists at Moseley, concealed among plantations made by Mr. Taylor when the heath was taken into cultivation.

#### HARTLEBURY COMMON.—(Near Stourport.)

The Club have several times explored this waste undulating sandy and boggy ground, as it has long been a favourite botanical fixture from the peculiar features it presents. A waste of incoherent sand similar to a sea beach here meets the view, diversified with bogs and pools nourishing many rarities, while the rising ground eastward forms a thick scrub of *Calluna vulgaris* that might be worthy of any heath in Scotland. Among the stems of *Calluna* creeping almost hidden from view, the *Lycopodium clavatum* grows luxuriantly, which is not met with in any other of our districts; and on this same bleak exposure the *Lycopodium alpinum* was once found by the Rev. Churchill Babington. Our worthy Secretary has been careful to see the specimen (which is a barren one) in Mr. Babington's herbarium, and in a case where otherwise some mistake might be supposed to have arisen, he has procured me a *Certificate* from Mr. Babington himself, which I subjoin.

“ August 22nd, 1849.

The *Lycopodium alpinum* was found by me on Hartlebury Common, Worcestershire, in 1836; on the rugged sloping part of it; as far as I can recollect.

CHURCHILL BABINGTON, M.A.”

But it is remarkable that Mr. Babington has omitted to say that a lady (Miss Lea) was with him at the time the *L. alpinum* was gathered, and as Mrs. Waller, of Stourport, she now comes in a corroborating witness; for she herself has in her herbarium another specimen of the *Lycopodium*, gathered at the same time as Mr. Babington's. This curious fact my friend Mr. Thompson has supplied me with.

Hartlebury Common is certainly most interesting ground, though it would appear that the rarer plants are gradually dying away, for the late Rev. T. Butt, Rector of Oddingley, mentions

having once gathered *Wahlenbergia hederacea* here, which can now no longer be found. I have myself collected the rare *Carex elongata* on a bank by a path through the fields, between the Common and the Severn, in 1851, but I could only perceive a single tuft of it any where about. The specimen is in my herbarium. So other species seem to be now in much less abundance than they formerly were.

On the bank of a little stream that runs by Tilton in its course to the Severn, I have noticed many very tortuous shrubs of *Ribes nigrum*, that appear of great age.

In the bog on the Common the little *Radiola Millegrana* and *Scutellaria minor* occur, both rarities in our county, as well as *Viola palustris*, *Rhynchospora alba*, and *Carex curta* and *ampullacea*. *C pilulifera* grows on the ridgy part of the waste.

A shallow pool near the bog is nearly filled with the beautiful Buckbean (*Menyanthes trifoliata*), which I have seen a person from Dudley gathering there for medicinal purposes. *Erodium maritimum* grows at both the north and south ends of the common; and on the bare sand *Teesdalia nudicaulis* and *Hypochaeris glabra* most plentifully. In the low marshy spots adorned with the elegant *Polytrichum commune*, *Sphagnum acutifolium*, *obtusifolium*, and other mosses, the humble *Lycopodium inundatum* creeps unseen except to a prying eye, and I am not aware that it flourishes anywhere else in the county.

The drier parts of Hartlebury or Mitton Common, as it is now perhaps more generally termed, are overgrown with the hoary-tipt moss *Trichostomum canescens*, the Reindeer lichen (*Cladonia rangiferina*), the grey *Cladonia furcata* and *uncialis*, as well as the sombre but brittle *Cornicularia aculeata*. Many varieties occur of the ubiquitous and multiform *Scyphophori*, the most remarkable is *S. gracilis*. On some of the sand rocks I have noticed *Targionia hypophylla*; with *Urceolaria scruposa*, and other lapideous lichens. In a deep sandy lane near Blakedown Pool, the local Hornwort (*Anthoceros punctatus*) grows very profusely in the damp shade, and I have here gathered it in fine fructification.

I append the following List of Plants attached to the sandy

country around Kidderminster and Stourport, all recently identified except the few marked with an asterisk. It may be useful for examination and reference.

## PLANTS OF THE VICINITY OF KIDDERMINSTER AND STOURPORT.

*Corydalis claviculata*. Habberley Valley; Petiford Lane, near Park Hall.  
*Turritis glabra*. Under Lea Castle Park wall, and in several spots about Kidderminster and Wolverley.

*Cardamine impatiens*. Lincombe. Wichbury Wood. About Holly-Austin Rocks.

*C. amara*. Fenny Rough.

*Teesdalia nudicaulis*. Plentiful on Mitton Common.

*Sisymbrium Sophia*. About Kidderminster, but almost unknown in other parts of the County.

*Viola pumila*. On and about Hartlebury Common. (*V. flavicornis*, Smith.)

*V. palustris*. Among *Sphagna* in the same place.

*Drosera rotundifolia*. Bogs on Hartlebury Common.

*Dianthus deltoides*. Mentioned as growing on Blackstone Rock, by Purton, many years ago, but often sought in vain, till re-discovered by Mr. Thomas Westcombe, of Worcester, in 1851; also at Cookley, near the Canal, half-a-mile west of the Church, by Mrs. B. Williams, 1852.

*Malachium aquaticum*. Wannington Downs, and near Hurcott Wood, &c.

\**Silene Anglica*? Mentioned in Scott's "History of Stourbridge," but not to be found at present.

\**Silene conica*. "Iverley Common." Scott.

*Sagina ciliata*, Fries. (*S. patula*, Jord.) Blakedown A "critical" species, confirmed by Mr. Babington, to whom it was sent by our careful Secretary.

*Radiola Millegrana*. Moist spots on Hartlebury Common.

*Erodium maritimum*. On banks both at the north and south ends of Hartlebury Common; also at Trampley Green, and Habberley Valley.

*Hypericum Androsæmum*. Wood between Wolverley and Cookley.

*H. montanum*. Habberley Valley. Jordan.

*Melilotus arvensis*. Gathered in an arable field at Wolverley, in 1853. Mr. W. Mathews.

*Trifolium arvense and striatum*. Both abundant on Hartlebury Common, and near Churchill.

*Ornithopus perpusillus*. On Hartlebury Common, and base of Horsley Bank.

*Rubus suberectus*. By the bog on Hartlebury Common, and falling Sands Lock, near Stourport; also at Blakedown Pool.

*R. plicatus*. On the road to Shatterford, and towards Warshall.

*Comarum palustre*. Bog on Hartlebury Common.

*Potentilla argentea*. Frequent about Kidderminster, according to Mr. W. Mathews.

*Rosa spinosissima*. Roadside between Kidderminster and Park Hall; also opposite Hodge Hill, and between Park Hall and Blakedown:

*R. villosa and tomentosa*, also occur, not uncommon.

*Cotyledon umbilicus*. On the rocks in Habberley Valley, luxuriant; on Holly Austin Rocks, and the cliffs near Cookley Wood.

*Sedum dasyphyllum*. Wribbenhall and Blackstone.

*Saxifraga granulata*. This plant grows abundantly on sandstone rocks in this district, and is especially plentiful in the lanes of Wolverley, between the "Happy Valley" of the Ordnance Map, and the rocks of Cookley Wood.

*Chrysoplegium alternifolium*. Damp places in Hurcott Wood.

- Heliosciadium inundatum*. Pools on Hartlebury Common.  
*Enanthe crocata*. Wet places near Stourport; lane at Lincomb.  
*\*Sium latifolium?* "Blakedown Pool." *Scott*. Most likely an error, as *S. latifolium* is now unknown in Worcestershire.  
*Hypochoeris glabra*. On the sandy part of Mitton Common, next Stourport, very abundant.  
*\*Lactuca virosa*. On Mr. Bree's authority in Purton's Midland Flora; but unconfirmed by any member of the club.  
*Cichorium intybus*. Near Stourport.  
*Onopordium Acanthium*. Near Wolverley. *Jordan*.  
*Gnaphalium sylvaticum*. Bisshill, near Park Hall; and by the side of a lane near Churchill, towards Pedmore Common; also at Charlton.  
*Filago minima*. On Hartlebury Common.  
*Erigeron acris*. Habberley, near Kidderminster.  
*Inula conyza*. Wolverley. Pedmore. Stewponney. Plentiful at Lincomb.  
*Anthemis nobilis*. Trampley Green, near Habberley.  
*Hieracium umbellatum*. Hodge Hill. Habberley, near Kidderminster.  
*Campanula latifolia*. Wood, near Cookley.  
*C. patula*. Near Hurcott Wood; also at Blakedown, Bellbroughton, Churchill, and Hagley.  
*\*Wahlenbergia hederacea*. Recorded as found by the Rev. T. Butt, Rector of Oddingley, many years since on Hartlebury Common; but sought now in vain.  
*Erica Tetralix*. Bog on Hartlebury Common.  
     *cinerea*. Abundant about Stourport, Bewdley, &c.  
*Vaccinium Myrtillus*. Habberley Valley. Ribbesford Woods.  
*Menyanthes trifoliata*. Completely filling a large though shallow pool on Hartlebury Common, but quite rare now in Worcestershire. Also in a ditch by the Staffordshire canal, just out of Kidderminster, on the Wolverley side. *Rev. W. W. How*, one of our first members, now removed into Salop.  
*Echium vulgare*. Abundant in this district, but scarcely known either about Malvern or the southern parts of the county.  
*Myosotis versicolor*. Bishop's Wood, near Hartlebury. Most abundant after a fall of coppiece.  
*M. collina*. In Habberley Valley.  
*Veronica scutellata*, Var. *pubescens*. Bog on Hartlebury Common.  
*Antirrhinum Orontium*. Between Wribbenhall and Spring Grove. *Jordan*.  
*Verbascum virgatum*. In sandy fields at High Habberley, apparently indigenous at the spot; far removed from gardens.  
*V. Lychnitis*. Near Wolverley, and on the road between Park Hall and Kinver. Found growing most profusely (full 200 plants), on Cornhill, a meadow sloping down to the Stour, near Cookley, in Sept. 1853, by Mr. W. Mathews and myself.  
*V. nigrum*. Not uncommon. Roadside between Kidderminster and Park Hall.  
*Digitalis purpurea*. Of common occurrence.  
*Mentha sylvestris*. Hurcott Brook, near Park Hall.  
*M. viridis*. Wet clayey places, on the Turnpike Road between Hagley and Halesowen.  
*\*M. Pulegium*. Pensnet Reservoir. *Scott*.  
*Marrubium vulgare*. Mitton, near Stourport.  
*Calamintha Acinos*. Habberley Valley, and hills in the vicinity. Also on Blakedown.  
*\*Leonurus Cardiaca*. "Iverly Hills and adjoining fields." *Scott*.  
*Scutellaria minor*. Bog on Hartlebury Common.  
*Nepeta Cataria*. Not uncommon about Kidderminster.



*Lamium amplexicaule*. A common weed in the district.

*Rumex pratensis*. On Wannerton Downs.

— *sanguineus*. Frequent in the district.

*Paris quadrifolia*. Habberley Valley.

*Taxus baccata*. The solcmn Yew appears in a truly indigenous state in the hilly woods between Wolverley and Shatterford; and in a wood at the latter place, on the Bridgnorth Road; the banks of the little stream there are involved in gloomy horror with its lugubrious verdure. Also some fine old trees on Horsley Bank.

*Epipactis latifolia*. Wichbury Hill, and by a small pool between Pedmore Church and Stourbridge.

\**E. grandiflora*. Recorded by Dr. Stokes (1787) as growing in "Knight's Walks, Wolverley;" where it was sought in vain by Mr. W. Mathews and myself. In Lea Castle Woods, according to *Scott's Hist. Stourbridge*.

*Ornithogalum nutans*. Hoarstone, Warshill. *Jordan*.

*Colchicum autumnale*. Frequent in pastures. "A meadow at Bellington near Kidderminster, is full of a variety with white flowers." *Mr. W. Mathews*.

*Juncus squarrosus*. Hartlebury and Pedmore Commons.

*Butomus umbellatus*. Staffordshire canal, near Sion Hill. *T. Thurstfield, Esq.*

*Sagittaria sagittifolia*. Pools at Hartlebury.

*Typha angustifolia*. Hurcott Pool, &c.

*Potamogeton oblongus*. Ditches on Hartlebury Common, bordering the bog there.

*Rhynchospora alba*. Bog on Hartlebury Common, its only known locality in Worcestershire.

*Scirpus sylvaticus*. Boggy ground, not unfrequent.

*Isolepis frutitans*. Little pools on Hartlebury Common.

*Eriophorum angustifolium*. Plentiful in Hartlebury Bog.

*Carex stellulata, curta, elongata, paniculata, binervis, strigosa, Pseudo-Cyperus, pilulifera, ampullacea and vesicaria*. All at or in the vicinity of Hartlebury.

\**Carex teretiuscula*? "Marshes near the heath. Harborough Pool." *Scott*.

*Nardus stricta*. Fine and abundant on Hartlebury Common.

*Milium effusum*. Fenny Rough, &c.

*Aira caryophylllea*. Bisshill, near Kidderminster.

— *præcox*. Hartlebury Common, sometimes very tall, and puzzling in aspect.

*Avena pubescens*. In meadows at Park Hall, near Kidderminster.

*Triodia decumbens*. On Hartlebury Common.

*Catabrosa aquatica*. Wet places; frequent.

*Glyceria aquatica*. On the side of the Staffordshire Canal, near Kidderminster.

*Festuca bromoides*. Not unfrequent.

*Lolium Italicum*. On Bisshill, near Kidderminster, but introduced.

*Botrychium Lunaria*. Sandy fields among *Pteris Aquilina*, near High Habberley.

*Osmunda regalis*. Near Cookley, and in a hedge at Fenny Rough, as before adverted to.

*Equisetum Telmateja*. At Fenny Rough, &c.

*E. sylvaticum*. In a wet place on the bank by the side of the road to Bewdley, near Summer Hill.

*Lycopodium clavatum*. Growing luxuriantly among *Calluna vulgaris*, on the high exposed ridge of Hartlebury Common.

*L. inundatum*. Abundant in the marshy parts of the Common just mentioned, especially on its western side.

*L. alpinum*. Once gathered on the exposed part of Hartlebury Common, by Miss Lea, (now Mrs. Waller,) and Rev. C. Babington.

In the preceding enumeration several plants have an asterisk and query, as neither myself or any member of the Club have ever observed them in the localities stated, or indeed anywhere else within the county. Several of them are taken from a Catalogue of Plants mentioned as growing in the vicinity of Stourbridge, by the late *William Scott, Esq.*, of that place, in his "History of Stourbridge." Mr. Scott appears to have been a friend of the late Mr. Purton, author of "the Midland Flora," and as Purton has recorded many of Scott's localities in that work, it seems probable that he actually saw the specimens so recorded. I do not like to pass over the recorded observations of others with incredulous superciliousness, though as some of the plants seem unlikely, Scott, like other botanists of an earlier day might make a mistake. At the same time it must be remarked, that the country has much changed its appearance since Mr. Scott botanized in it, and Cradley Park, to which he frequently refers, has been entirely enclosed and cut up. It is possible enough that *Pyrola media* may have grown there, and perhaps *Silene conica* in the sandy fields at Iverley, as he records. He also mentions a "morass near Pedmore Common," where the Cranberry (*Vaccinium oxycoccos*) grew in his time, now lost. Still as such places as Harborough and Blakedown Pools, and Pensnet Reservoir, must yet remain, it is perhaps best to leave Mr. Scott's plants still open to further enquiry and examination. One or two occur in the Midland Flora on Mr. Bree's authority, yet even these have not been detected by collecting botanists of late years.

#### WOODS ON THE WESTERN BANKS OF THE SEVERN.

About four miles south of Stourport, on the banks of the Severn, the sandstone cliffs there prominent, and the undulating grounds in connection with them are clothed with wood, and a deep brook here running into the river, divides the woods of *Astley* and *Shrawley*. In *Astley* Wood the Snowdrop (*Galanthus nivalis*) grows; and *Tulipa sylvestris* was formerly to be found

on a bank south of Astley Church, but is now gone. Both these however, are probably only instances of naturalization, however "truly wild" the Snowdrop now appears, and the Tulip might have done. It should be borne in mind that plants are ever *trying* to extend their bounds, and if the climate and other circumstances admit, will do so. \*

SHRAWLEY WOOD, occupying an extent of about five hundred acres, is remarkable for a great part of it consisting of an undergrowth of *TILIA* (Lime-tree), which is regularly cut down as coppice-wood, and is therefore never in a flowering state. Thus circumstanced, the leaves put on the appearance of those of *Tilia Europæa*, quite glabrous except at the origin of each vein beneath, and scarcely glaucous; yet certainly all old lime trees in the neighbourhood belong to *T. parvifolia*.\* Ockeridge Wood, near Holt, though in a lesser degree, nourishes the same tree, as well as various coppices on the eastern side of the Severn between

\* From the variable appearance of the leaves of pollarded limes, I am led to the conclusion that *T. Europæa* is but a variety of *parvifolia*; indeed I can perceive no distinction except in the harder and more villous fruit, for the leaves are variable to a degree, those of pollard *parvifolia* frequently as large as those of *grandifolia*, though in that case *very smooth*. *TILIA PARVIFOLIA* as it appears in Worcestershire in unlopped trees, may be thus characterized:—

Young shoots polished glabrous. leaves cordate smooth, glaucous beneath with smooth veins, *with a large tuft of brown wool at their common origin* and smaller tufts at the origin of each secondary vein, *on petioles longer than the leaves themselves*, the bractæas *not extending so far as the small turbinate brittle hairy fruit*.

*T. Europæa* has been characterized by Sir J. E. Smith, as having "leaves twice the length of the footstalks," but this is the case in pollard trees of *T. parvifolia*. The common and partial hairy blotches are, however, much less conspicuous in this than the latter, the fruit is larger and much more obviously angular, and the bractæa is *nearly on a level with the flowers or fruit*, or longer. This appears to be synonymous with *T. intermedia*, D C., and is thus mentioned by Grenier and Godron, in their "Flore de France." "Se distingue de la précédente espèce par ses fleurs un peu plus grandes; par ses fruits 2 fois plus gros, *ellipsoïdes et non subglobuleux*, à côtes saillantes et à paroi presque *ligneuse*; enfin à ses feuilles vertes un peu pâles en dessous, plus brièvement *petiolées*." In leaf, only, many trees have occurred to me which it was difficult to say whether they were nearest in character to *T. parvifolia* or to *T. Europæa*. *T. grandifolia* occurs naturalized in several spots, and its leaves, though not always large, have a peculiar character. They are very downy beneath, the ribs densely ciliated, serratures hairy, petioles thickly clothed with hairs, and nearly as long as the leaves. Flowers and densely woolly fruit extending much beyond the bracts. The young shoots in this species are always closely hairy.

Ombersley and Hawford, where also *T. grandifolia* exists in a naturalized state.

A very old and remarkable pollard tree of *Tilia parvifolia* stands by the side of a little pool, at Hawford, on the ridge not far removed from the Severn. The base is more than forty feet round, and six large boles rise from this in a semicircular manner. It is probably more than three hundred years old. Its bark is partially overgrown with Lungwort (*Sticta pulmonaria*), quite a rarity in Worcestershire, as I have only met with it here, and on an old battered pear tree at Bush Hill, in the parish of Powick. In a coppice near the fourth milestone on the Ombersley road, is another very old and hollow lime tree, of very singular appearance.

In fact, commencing with the border of Wyre Forest, and proceeding southward, the lime as either *Tilia Europæa* or *parvifolia*, appears in numerous woods, coppices, and old hedgerows, to the very end of the Malvern range near Bromsberrow. The base of the Round Hills near Abberley, Ockeridge Wood, the western base of the Berrow Hill near Martley, the banks of Leigh brook, Rosebury Rock, on the Teme, the Old Storridge Hill, the country about Great Malvern, and ancient woods in the parishes of Castle Morton and the Bérrow, may be particularly mentioned. Many of the old lime trees get pollarded, and then in the course of years put on a very grotesque appearance.

The birch (*Betula alba*), is characteristic of most of our upland woods, and where plentiful makes a most elegant appearance, and has given its name to many places.\* Near Acton Beauchamp an entire grove consisting only of these indigenous trees, yet remains.

\* Birchin Grove, near Broadheath, on the Martley road, may be cited; and though this once noble wood has been of late years cruelly curtailed, it still treasures up a few rare plants within its confines, and well merits the attention of the local botanist. It is the only place near Worcester where the *Rubus plicatus* grows; and it is peculiarly rich in the wonderful forms of *Fungi*. The still unenclosed portion of Broadheath is not far off, and on this little botanical oasis the beautiful Heath *Erica tetralix* grows, as well as the prickly *Genista Anglica*, and the heathy grasses *Meibomia corulea*, and *Nardus stricta*.

The woods in the valley of the Severn mostly occupy the rising ground, clothing marly hills or sandstone heights, that seem to stand boldly out as barriers to a former wider spread of water, giving an undulating if not pictorial aspect to the landscape. Some of these have flowery features not unworthy of notice in their season, as Shrawley Wood in particular, eight miles north of Worcester, long celebrated for its glades odorous with the Lily-of-the-Valley (*Convallaria majalis*), and at a later period finely adorned with the tall Broad-leaved Bell flower, *Campanula latifolia*. Here too by the side of Dick Brook, the Shepherd's Staff (*Dipsacus pilosus*) forms lofty thickets, and *Gnaphalium Sylvaticum* is not very uncommon. Several ponds of water diversify the shady recesses of Shrawley, giving it a character different to all our other woods, and tempting the wandering naturalist again and again to

"Track half-hidden from the world besides,  
Sweet hermit nature that in woodlands hides."

So here have I year after year rambled through bowery paths with many friends, some of whom can wander on earth no more, and here our Club have several times met, generally with good results. The Wood Vetch (*Vicia sylvatica*) grows among the bushes in the wood, and also *Sedum telephium*. Other plants growing here are the Columbine (*Aquilegia vulgaris*) the lesser Winter-green (*Pyrola minor*), greater Broom-rape (*Orobancha major*), and the Birds-nest Orchis (*Neottia Nidus-avis*.) The delicate Oak-fern (*Polypodium Dryopteris*) occurs on a shaded sand rock that overhangs a deep receptacle for water excavated in the stone below.

Plants will of course present themselves in these woods more or less abundantly, according to the exposure of their recesses to the sun by the annual and changing falls of coppice. Occasionally I have observed in the wide exposed spaces left by the fallen coppice, as in Shrawley Wood, and on Helbury Hill, near Worcester, such quantities of the spreading Bell-flower (*Campanula patula*), that the ground was quite starred with azure from

the abundant flowers of the plant; indeed *C. patula* though not of general occurrence, is quite plentiful in various parts of the valley of the Severn in Worcestershire. The appearance of orchideous plants is much influenced by the light and temperature that breaks in upon the coverts where they grow, for in some seasons it is difficult to find the Sword-leaved Helleborine (*Epipactis ensifolia*) in the Wyre Forest; while when I once visited it in company with my friend the Rev. Andrew Bloxam, whole glades of the exposed portion of the green wood were perfectly white with its elegant flowers. It grows also in Witley Park, near the entrance lodge, but is not to be found every season.

This shyness of plants to present themselves under favourable circumstances, is well exemplified by an observation of our active associate, Mr. Thomas Baxter, with reference to *Epipactis purpurata*. This rare plant first previously noticed many years ago in Worcestershire, in the parish of Leigh, by Dr. Abbot, was found in some plenty by Mr. Baxter in Nunnery Wood, in 1849. It was there the following year, but as the coppice wood grew up, rapidly fell off, and at the present time the place which it occupied being entirely overgrown, it no longer appears. So in 1855 my young friend Mr. W. Cheshire, of Stratford-on-Avon, found the very local *Epipactis grandiflora* in a copse by the side of the Lower Lode Lane, near Tewkesbury, where I fear it will not be easy to find it again. Our well known venerable associate Mr. George Jordan, so long connected with Bewdley botany, was fortunate enough to meet with a single specimen of *Spiranthes aestivalis* on the margin of the great bog in Wyre Forest, in the summer of 1854, and I have seen the specimen he gathered. I believe there had been some felling of the wood here, for it was just on the edge of the trees that the *Spiranthes* was found; but no more have been since discovered, although I made a diligent investigation of the spot in company with Mr. Jordan, in 1855.

The rare Reed Fescue Grass (*Festuca Calamaria* or *sylvatica*), was communicated to the late Sir J. E. Smith, by W. Moseley, Esq., of Winterdyne, as growing in Shrawley Wood, and I have

a specimen from thence kindly presented me by that gentleman's accomplished daughter, Miss Harriet Moseley, whose inimitable collection of wild British plants painted by her own hand does her so much credit. Yet I have been unable to find the grass myself, after repeated visits to the wood, and no recent botanist has observed it there. But Mr. Moseley stated that this remarkable grass only appeared on sandstone ledges of the wood after periodical falls of the coppice, so that continued research may perhaps yet discover it *in situ* again.

Sunshine or the want of it, may make all the difference to the vegetation of a wood, which when open to day may be beautified with primroses, oxlips, blue-bells, and various other spring flowers, and in a few years after be totally choaked up with thistles, burdocks, or the tussocks and lofty culms of *Aria caespitosa*. Plants in fact will occasionally swarm like insects, and thus I remember to have seen Orl Coppice at Rushwick filled with the *Cardamine amara*, presenting a beautiful appearance when in flower, while a few seasons after I could not find a single specimen of the plant growing there. Monk's Wood, Grimley, is almost filled with the Wood Reed (*Calamagrostis epigejos*), which is not so common in other woods.

I may here mention in connection with the sudden appearance of plants from disturbing causes, that when a few years since an embankment was made near Powick bridge by Mr. Smith to protect his meadows from the incursions of the Teme, that the very next year *Cardamine impatiens* appeared in great quantities on the embankment, though unnoticed there before. The same thing happened when the weir and new cut was formed by the engineer of the Severn commissioners at Lincomb, near Stourport. The *C. impatiens* has since disappeared from Powick; but in 1855 the plant still continued in abundance at Lincomb.

In 1843, soon after the road and embankment from the new iron bridge was formed at Powick, I observed the great Whitlow Pepperwort (*Lepidium Draba*) growing plentifully upon the side

of the embankment, though from what source it sprung up there is a mystery. It continued at this place in profusion for some years, but has gradually got less as the hedge has grown up, and now (1856) only a very few plants remain at the spot.

About nine years since (as recorded at the time in the Phytologist) I observed a great quantity of *Atriplex hortensis* and *Beta maritima*, growing on the embankment formed for the Oxford and Wolverhampton Railway on the summit of Tallow Hill, Worcester. The railway at that time was only in a state of formation, and whether the seeds from which the plants had sprung up had lain dormant in the soil, or been conveyed in rubbish from a distance, I cannot with certainty affirm; but an orchard near at hand as well as a garden in the vicinity had been cut through. The plants flourished for three years at the spot, and I was at the trouble of throwing seeds on the land around to perpetuate them; but after the railway was opened for traffic they soon disappeared, nor have I observed them anywhere about the neighbourhood since that time.

Deposits of manure or rubbish from gardens on roadsides, will often produce rampant plants, such as Henbane (*Hyoscyamus niger*), the Cotton Thistle (*Onopordium Acanthium*), the Milk Thistle (*Carduus Marianus*), and even the foreign Thorn-Apple (*Datura Stramonium*), but these wandering plants dropped in nature's haste all prove fugacious, and are seldom seen again the following season. A few obstinately continue on the ground where they have established themselves, for the Primrose-leaved Mullein (*Verbascum virgatum*) was observed more than half a century ago on the side of the Ombersley road, at Bevere, near Worcester, as recorded by the late Dr. Stokes in his edition of Withering's Botany, and I myself gathered it in the same spot in 1829. It then disappeared for many years, but strange to say has recently again turned up at the same locality.

Traces of former garden cultivation are sometimes evident in the appearance of such plants as the Capeweed (*Euphorbia*



*Lathyris*,) Evergreen Alkanet (*Anchusa sempervirens*,) Soapwort (*Saponaria officinalis*), or *Campanula rapunculoides*. When our Club met at the Rev. W. Lea's, St. Peter's, Droitwich, in July, 1855, and thence explored the country to the Trench Wood, two straggling plants of *C. rapunculoides* were seen growing in a bushy place by the side of the footpath between St. Peter's and Hadsor. Some of our more enthusiastic members were inclined to hail this as a grand discovery, for the willow copse in which the Rapunculoid Bell-flower grew seemed wild enough. But I am become sceptical as to straggling garden plants, and on close inspection it was evident that garden rubbish had been deposited at the spot, and close at hand too, were several plants of horse radish growing. In like manner the late Dr. Streeten, of Worcester, reported *Euphorbia Lathyris* as wild in Crow's-nest Wood, but on visiting the spot I found it was where a cottage had stood only a few years before, and the *Euphorbia* was a vestige of its garden. Many years ago the late Mr. J. T. Goodman brought me specimens of *Crocus vernus*, from the middle of a meadow by the side of Battenhall Lane, with the bulbs so very deep in the earth that it was most difficult to get them. This was no doubt the site of an old garden, or the bulbs had been thrown out of a garden some time or other. Even with regard to the Soapwort, though now spreading about the banks of the Severn at Grimley, and near Bewdley and other places, I am yet pretty confident that it is only a straggler from cultivation in Worcestershire.

One curious instance resulting from presumed ancient garden cultivation merits notice, especially as it was obvious to all residents in Worcester for so many years. This was the growth of the Inelegant Ragwort (*Senecio squalidus*), on the old buttresses of the walls close to the gateway at the Priory Ferry. These it occupied unmolested for many years as I can witness, but in 1847 a new esplanade was formed along the side of the Severn, and other buildings erected at this spot for the Rev. Canon Wood, when his too careful workmen scraped the old buttresses quite clean, and destroyed the Ragwort. It still flourishes, however

on the wall of a neighbouring garden in the occupation of Mr. Dolvere, the sexton of the cathedral, where I trust it may long remain. It is remarkable that in an old pocket-book once belonging to the Rev. T. Shirley, Rector of St. Swithin's, and now in the possession of the Rev. J. H. Thompson, Incumbent of Cradley, and one of our active members, there is a M.S. note stating the *S. squalidus* was growing at the back of the College Stables, in June, 1800, though unnoticed in any botanical work until I brought it forward in 1834. The probability is that the *Senecio* was originally derived from the garden of the Monastery of St. Mary's, which must have been very near this place.\*

How garden plants extend their range to neighbouring walls, and continue there, is quite obvious in the present day from the great Snapdragon (*Antirrhinum majus*), and Ivy-leaved Snapdragon (*A. cymbalaria*), seen yearly on various old ruinous buildings or walls; and the Red Valerian (*Centranthus ruber*), as well as the common Parsley, are familiar instances. I once observed a large quantity of the Yellow Fumitory (*Fumaria lutea*), growing in a shady lane at Abberley, not at that time in proximity to a garden, though doubtless it had escaped from one. So as to the greater Periwinkle (*Vinea major*), the Horse Radish (*Cochlearia Armoracia*), and many others, too readily assumed to be indigenous.

Fallow fields sometimes allow alien plants to become "sqatters" upon their waste spots, whether brought by winds or sheep that depasture there is difficult to say; but thus the pretty *Veronica Buxbaumii* has within the last few years appeared to claim a locality in the midst of cultivation, and in 1850 it was very plentiful in a fallow field near Bubble Bridge, St. Johns. This season I observed it in a field at Trimpley, near Kidderminster,

\* That domesticated plants especially of the Composite kind, may easily extend themselves is shown by the fact of my friend Professor Buckman taking seeds from the *S. squalidus* at Worcester, which coming up in the garden of the Agricultural College at Cirencester, the plant is now a weed in the College Garden, and may spread beyond it.

and though of course the plough disturbs it for a time, it keeps "bobbing about" from one spot to another, and may now be considered as fairly naturalized.

It is remarkable that within the last six or seven years that both the wild Tulip (*Tulipa sylvestris*), and the common Star of Bethlehem (*Ornithogalum umbellatum*), have established themselves on Pitchcroft Ham, Worcester, where doubtless some flood of the Severn, which almost every year covers this meadow, has washed them among the roots of the grass. They extend their borders more and more every year, but in this position I have never observed the Tulip to flower as yet.

Quite recently the Rose-bay Willow Herb (*Epilobium angustifolium*) has become numerous in several parts of the Vale of Severn, and promises to spread, incited to take possession of new made roads and embankments. I have observed it by the side of a diverted road near Shatterford, and in the cutting of the Birmingham and Gloucester Railway, near Croome Perry Wood.

Among recent agrarian pests that have doubtless been imported with seed from abroad, I may mention here the two Dodders, *Cuscuta Epilinum* and *Trifolii*; the former is almost sure to appear wherever flax is planted, and I have seen it in a field at Tibberton, near Worcester, as well as had information of its putting in an appearance in the Teme Valley. *Cuscuta Trifolii* I have hitherto only heard of as occurring at "Hungry Grafton," near Stratford, and near Alderminster, at the extreme South-eastern side of the county. It has recently so increased in Britain as greatly to injure the crops of clover, and indeed convert them into a mass of injurious clammy matter, as the stems of the Dodder twine inextricably on the stalks of the clover, imbibing their juices, and converting them into a dead organic mass devoid of any nutriment, which is all absorbed by the insinuating parasite. At every convolution it makes while growing round the clover, the Dodder inserts a sharp blade that penetrates the cuticle, forms a swelling, and thence as from a reservoir imbibes

the sap from the clover, starves and destroys it. The Clover Dodder seems to have established itself as a complete nuisance near Alderminster and Stratford, if I am to judge by the amount of specimens sent me in several boxes by my intelligent friend *Mr. William Cheshire, jun.*, of Stratford-on-Avon, in September, 1854, for they were stuffed together like hops in a pocket, and there was sufficient in bulk almost to stuff a bed !

The most remarkable plantal immigration that has fallen under the notice of British botanists in the present day, is however that of the Canadian Water-weed or "Drain-devil," as it has got to be locally termed, the *Udora Canadensis* of Nuttall and the American Botanists, but more recently named by Mr. Babington, *Anacharis Alsinastrum*. In Dr. Torrey's Flora of the State of New York, this water plant is described as "a submerged aquatic, with verticillate serrulate leaves (in 3's,) and minute flowers."—"Flowers polygamous solitary, from a tubular bifid spathe. Perianth 6-parted, petaloid."—It is merely remarked that its habitat is "Sluggish streams and shallow lakes frequent." Dr. Johnstone of Berwick appears to have first noticed the plant in Britain in 1841, when he gathered it in the Whiteadder, Berwickshire; but it was scarcely noticed until several years after found growing in great profusion in the reservoirs at Watford and Foxton Locks, on the Junction canal in Leicestershire. Within the last four years the *Anacharis* has advanced wonderfully, filling the canals in Cambridgeshire from a drain out of the Botanic Gardens, at Cambridge, and spreading along the canals and rivers of the Midland counties in all directions. Mr. T. Baxter first discovered it in Worcestershire in the summer of 1853, in a shallow pond once a clay pit, on the banks of the Severn opposite to Bevere Island, about three miles above Worcester; and with his usual acuteness, the same active member of our Club has since smelt out the plant in various other places, as in the abandoned bed of the Severn at Lincomb, in the reservoir of the canal at Diglis, and along the shore of the Severn itself

from near Worcester Bridge up to old St. Clement's Church, and it even extends still further up the course of the river.

In the summer of 1854, Mr. W. Cheshire informed me that he had seen the *Anacharis* taken out of the Avon at Evesham, where it was observed to be floating loosely down the river, for the brittleness of its stem renders it liable to be easily broken off by boats and barges; and he also informed me that it had been located for some time in the shallows of the Avon at Stratford. This induced me to look out, and in 1855 I observed the wandering water-weed flourishing in the Stanchard Pool, at Tewkesbury, which is connected with the Avon by a sluice; and the same year the Club met with it in a ditch at Pershore that is connected with the Avon. This year (1856) I also noticed another place at Evesham, where the plant was growing, in a ditch below the Ferry, connected with the Avon. It does not like deep water, and therefore only affects shallow places, drains, or ditches, where its stems crowd thickly together. Though a polygamous plant, only the fertile flowers have hitherto been observed in Britain, which says Sir W. J. Hooker, "favours the opinion that it must have been accidentally introduced; although we find it impossible to explain how it made its appearance in so many localities, and in the greatest abundance, much about the same time."

This immigration of the *Anacharis*, is after all, but a small return from America, for the many botanical presents England has sent to her; for according to Dr. Torrey's "Flora of New York," most of our British pond weeds, as well as *Zannichellia palustris*, *Alisma plantago*, *Sagittaria sagittifolia*, *Triglochin*, *Callitriche*, *Ruppia*, and *Zostera*, and all the *Lemna's*, have found their way to America. Sir Charles Lyell has described New England as a very Paradise for European weeds; and my friend, Professor Buckman met with many of them, including the common Mustard (*Sinapis nigra*), become quite gigantic in growth, in clearances among the forest on the banks of the river Ohio.

Dr. Torrey himself records a case exactly analogous to the inroad of the *Anacharis* into England. By some means unknown the *Valisneria spiralis*, a Continental water-plant, has made a passage from Europe to America, and is now found plentifully in the State of New York.

Dr. Torrey remarks, that the *Valisneria* is now "so abundant in the shoal waters of the Hudson, that in many places during the months of August and September it is difficult to row a boat through it."\* So on the land our little Knot-grass (*Polygonum aviculare*), has become very common in New York, having been unwittingly introduced by settlers from this side the Atlantic. There can be but little doubt, therefore, that interchanges of plants between different countries, will still continue to progress.

Temperature of course affects water as well as the soil, and occasions there changes among the lower algaic plants; for after several days very hot weather in spring or summer, stagnant pools become coloured green, or occasionally red, from the minute *Confervæ* or *Diatomaceæ* that are brought to the surface. In the summer of 1853 when the Club met at Droitwich, and examined the banks of the salt-water canal, its surface in many places was then quite covered with quantities of the green curling Alga, *Euteromorpha intestinalis*.

Heat like moisture prepares a new state of things fitted for organisms that would not otherwise appear, showing the wonderful energy of a directing Providence prepared for every incident that may arise. Thus when in very hot summers many ponds are dried up, a little spherical Alga, that might be supposed very uncommon, then presents itself, and covers the bottoms of the pools with its clustered green globules, that crackle beneath the tread as if formed of glass. This is the curious *Botridium granulosum*, which I have noticed under the circumstances stated, at Powick, Henwick, and Whittington.

\* Torrey's Flora of New York, 4to. Vol. 2, p. 266.

## RED-MARL CLIFFS OF THE SEVERN.

The more particular features of the banks of the Severn may next engage attention. Wherever the high banks recede, lawn-like meadows appear on either side, bounded by gently rising terraces and islet-like wooded hills and undulations, and in the farther distance westward—

“By the blue steep of distant Malvern wall’d,  
Solemnly vast.”

Where the precipitous banks hem in the stream they are mostly worn bare, composed of red sand-stone of the Trias series down to Holt, and crumbling red marl below that parish, as at the Ketch, Severn Stoke, Ryall, and the Mithe, near Tewkesbury. Many of these cliffs are fringed with wood, and characterized by the Wild Service Tree (*Pyrus torminalis*), while in the woods opposite Holt Castle, the Wild Cherry (*Prunus Avium*), abounds. These marly heights are not productive of rare plants, nor have they any thing peculiar except the precipitous cliff at the Mithe, a mile above Tewkesbury, which is crowded with tall stalks of the Woad (*Isatis tinctoria*), which in the month of May makes a magnificent appearance with their tall branched spikes of golden flowers. The woad has quite the appearance of being indigenous on the face of this cliff,\* where I have myself known it to grow for above forty years, and it is always to be found there. The *Smyrniium olusatrum* grows near the same place, but among the bushes at the northern end of the cliff.

I must now mention the botanic features in the immediate vicinity of the Severn. The shore in summer has generally a yellow fringe from the flowers of *Nasturtium sylvestre*, and

\* This red cliff at the Mithe being above the confluence of the Avon and Severn is geographically in Worcestershire, though locally in the county of Gloucester. Immediately opposite, on the other side of the Severn, is Bushley, which is in our county, and still further south is Chaceley, also in Worcestershire, but with Forthampton in Gloucestershire intervening. With this inter-lapping of parishes it becomes difficult to stick closely to a county boundary.

amidst thistles and the Meadow-Rue (*Thalictrum flavum*,) the Wild Mustard (*Sinapis nigra*,) often towers a gigantic weed. The imperforate St. John's-Wort (*Hypericum dubium*,) is often plentiful enough to form an object of beauty on the Severn banks, as well as the large-flowered Meadow Geranium (*Geranium pratense*). In marshy spots or about wet ditches close to the river, the tall *Glyceria aquatica* is very conspicuous, and in the flat meadows *Phleum pratense* grows very large, exhibiting excessively elongated spikes. The Wood Club-rush (*Scirpus sylvaticus*) often adorns the bank where any little spring patters down; while in pools partially shaded *Enanthe Phellandrium* very often abounds, choking them up with its monstrous pipy stems. In adjoining marshes the yellow *Iris pseud-acorus* grows very tall. Some *Carices* that are generally considered rare or local, are not of uncommon occurrence in the Severn valley, as the elegant *C. pseudo-cyperus*, and the rough *C. strigosa*. The latter occupies almost exclusively a shadowy ravine among the new red sandstone formation near Shrawley, where a rill plunges into the gloomy recess; and even occurs in a boggy dingle between Worcester and Cruckbarrow hill.

The Willows abound more along the courses of the smaller streams that run into the Severn than on that river itself, where thick set trees would interfere with the towing path; but willow beds occur in various spots, where *Salix helix* and *triandra* are the most observable species, with the commoner *S. viminalis*. Large trees of *S. alba*, *S. fragilis*, and *S. Russeliana*, are frequent on the banks of brooks and pools, and *S. Smithiana* more rarely. The Almond-leaved Willow (*Salix amygdaloides*) occupies the borders of the Laughern and other brooks in a long extent of tall bushes, known by their dark green and highly polished leaves. The remarkable Golden Osier (*S. vitellina*,) though often seen near rustic gardens, scarcely occurs in a truly wild state; and *Salix fusca* is quite unknown in Worcestershire. Near Worcester *S. alba*, var. *cærulea*, may



be noticed by brook sides and marshy places, while *S. caprea* and the Sallow division, are common enough.

### FERNS OF THE SEVERN VALLEY.

In woods and shady places the more common Ferns natives of Britain are very numerous, especially *Lastræa Filix-mas*, *Polypodium vulgare*, and *Pteris aquilina*. The latter is very abundant about the Abberley Hills, and choaks up many of our woods with its enormous fronds that rise six or seven feet high. The Hart's-tongue (*Scolopendrium vulgare*) is not so general. *Polystichum lobatum*, which appears to me well marked as a species from *P. angulare*, generally affects less exposed and moister places than its congener *P. angulare*, and is not so abundant.\* *Lastræa dilatata* revels in most damp coppices, and among alder-holts, often growing very fine and large there, as about Kidderminster, Blackstone Rocks, Hartlebury, &c., while *L. spinulosa* prefers drier woods, such as Shrawley and Crow's-nest; but Hooker and Arnott now unite them, and unquestionably very curious intermediate forms occur.

*Blechnum boreale* though not uncommon, is yet only found on moist banks, unenclosed heaths, and shady woods, as Wannington Downs, Hartlebury Common, Shrawley, &c., and thus its haunts from advancing cultivation become more restricted; and perhaps the same may be said of *Asplenium Trichomanes*, which prefers shade to grow well. But *Asplenium Adiantum-nigrum* grows along almost every lane, and *Asplenium Ruta-muraria* seems quite indifferent whether its location be the venerable tower of some old church, or a mere moss-grown brick wall.

*Atkyrium Filix-femina* is generally diffused about springs and in moist lanes; while *Lastræa Oreopteris* though equally fond of moisture is somewhat rare in the district, though sparsely occurring in Wyre Forest, Ribbesford Wood, and on the side of Abberley Hill. As before mentioned, the noble *Osmunda regalis* is now confined to boggy ground in the vicinity of Kidderminster;

\* I am unable strictly to refer any Worcestershire forms of *Polystichum* to "*P. aculeatum*," though fronds of *P. angulare* narrower than usual have been so called.

here at Fenny Rough this present year (1856) guided by our associate Mr. G. E. Roberts, I was happy still to perceive it, and gathered specimens in fine fructification.

*Ceterach officinarum* is almost absent from the Severn Valley, indeed I only know two places where it occurs, and both these places are at the northern and southern extremities of Worcestershire, and just without the boundary line. One locality is on the wall of Dowles bridge, a mile above Bewdley; and the other is on a brick wall at Forthampton, near Tewkesbury.

The Adder's Tongue (*Ophioglossum vulgatum*), is by no means uncommon in the meadows of the vale of Severn, though often unnoticed from being overtopped by the grass. It occurs plentifully in the Grimley meadows, and I have seen it at Northwick, Hazlewood near Hadzor, and in a meadow between Tibberton and Crowle. The occurrence of *Botrychium Lunaria* and the *Lycopodia* at Habberley and Hartlebury have been already mentioned. *Equisetum limosum* is pretty general in pools and marshes, nor is *E. palustre* very uncommon in boggy spots such as Hartlebury Common. The elegant *E. sylvaticum* occurs in a damp spot on the side of the road between Kidderminster and Bewdley, and is rather frequent in Wyre Forest. *E. Telmateia* is, however, much more plentiful, for scarcely any marshy place near trees is without it. About Abberley and Witley, *E. Telmateia* is abundant, and it even occurs at Battenhall near Worcester.

The smaller Cryptogamia I have left out of view in this essay, but the *Marchantia* can scarcely be omitted, as in some instances they form a very conspicuous line of vegetation. In examining the wild broken sandstone country about Cookley Wood in 1854 with the Rev. J. H. Thompson, I was astonished at the close verdant matting made by *Marchantia conica* upon the side of the brook near Drakeley, as it flows towards "the Happy Valley" of the Ordnance Map. This "Liverwort," as the country people call it, was then too in splendid fructification. *M. hemisphærica* and *Targiona hypophylla* grow on the moist sand rocks about

Hartlebury. Cookley Wood and the rocky country about it, forms an odd corner of the county between Kidderminster and Kinver Edge, which though out of the way, is worth penetrating to for its wildness and seclusion. The rough ground is studded with bushes of the autumnal Gorse (*Ulex Gallii*) as well as the *U. Europæus*, and massive rocks of sandstone start up as if reared by some convulsion. On these rocks the *Didymodon rigidulus* forms thick cushion-like tufts, and in some places they are hung with a dismal black *Collema* in rugged webs. I never observed the grey pitted lichen *Urceolaria scruposa* in such large patches before, and on the sides of the lanes below near Drakeley, the Dog-lichen (*Peltidea canina*) was equally overgrown. In the same lanes the pretty Apple Moss (*Bartramia pomiformis*) adorned the ground, and no doubt more species of mosses may be discovered here, the locality being very congenial for the cryptogamic tribes. I observed *Lecidea viridescens* in dense clusters upon the trappoid conglomerate between Horsley Bank and Kidderminster.

#### LONGDON, WELLAND, AND OTHER MARSHES.

Without going so far back into geological conjecture as the period when according to Sir Roderick Murchison a sea called by him the "Straits of Malvern," existed between the hills of Malvern and the Cotteswolds, in the present valley of the Severn; there are still manifest traces that at a comparatively recent period the estuary of the river extended much higher up the interior of the country than at present, and that in fact a great saline backwater advanced even north of Stourport. Unequivocal evidence of this appears in the Longdon and Welland Marshes, near Upton-upon-Severn, the former of which in a wet autumnal season exhibits the only semblance of a natural lake that Worcestershire has to show, and their outlet into the Severn is by such a sluggish channel, that hitherto it has been found impossible adequately to drain them. The sandstone cliffs at Habberley Valley near Kidderminster have evident water-marks upon

them, and appear to have bounded a creek or bay of the sea at that spot; while on the rock at Lincomb, forty feet or more above the present summer level of the Severn, hollows of watery action are plainly visible on the cliff, fresh as of yesterday, though no recent dash of water could possibly have reached so high. On either side, too, of the course of the Severn, are terraces of gravel and sand, rendering it certain that the water-level here has been anciently much higher than at present. In fact broken and comminuted shells of *Mollusca* such as now exist in estuaries, have been found among the sand and gravel, as noticed in Professor Buckman's "Ancient Straits of Malvern."

Formerly salt springs called *Wiches*, were very common in the flat parts of Worcestershire, and a few yet remain noticeable, as on Defford Common, Pirton Common, and at Saldon near Himbleton, all which places were doubtless the site of saline marshes in the estuary period. Under the guidance of the Rev. W. Lea, our club visited Saldon in July, 1856, and in the midst of a fine grassy meadow were surprised to see *Alsine media* (*Lepigonium*, *Bab.*), *Sclerochloa distans*, *Juncus Gerardi*, and an *Atriplex*, which is probably *A. Babingtonii*, all clustered in and around a small circumscribed bit of boggy ground, the oozy birth-place of a sluggish salt-spring.

Several littoral or marine species of plants yet remain in the valley of the Severn to testify the former spread of brackish water much further up the country than is now the case, and these come in aid of the geological data, and are highly important. I believe that it is only in Gloucestershire and Worcestershire that *Enanthe pimpinelloides* is known as an inland plant. I have traced it from Wainlode Cliff below Tewkesbury to Powick three miles from Worcester on the western side of the Severn, and to Cruckbarrow two miles from Worcester on the eastern side. At Powick the *Enanthe* is most abundant in the meadows by the side of a brook that runs into the Severn below the Ketch, and the plant may even be traced to Maddresfield, within three miles

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of Great Malvern.\* It probably marks the boundary of a back-water to the estuary of the Severn, that once extended in this direction. It is now about fifty miles from Worcester to Framilode, below Gloucester, where the saline water becomes obvious at the present time. *Scirpus maritimus* is yet abundant in the ditches of the Longdon Marshes, and at Sarn Hill, southward, I observed the sea-side grass *Gastridium lendigerum* growing, a few years since (1840). Close to Hartlebury Common, as before observed, the Sea Storks-bill (*Erodium maritimum*) is still found.

The level tract of country south and west of Upton-on-Severn known by the names of the Longdon and Welland Marshes, claims more especial notice. Longdon Marsh in particular, consisting of about three thousand acres, is covered with water in a wet autumnal season, and at that time assumes the appearance of an extensive lake. Its waters are then on a level with if not lower than those of the river, so that by the present outlet the marsh cannot be properly drained. Even in summer a few days continued rain inundates these flat meadows, and the mowers have then to cut the grass knee deep in water. In autumn the marsh is covered with geese, and the ground white with feathers presents a strange barren aspect amidst the cultivated country that slowly advances upon its lessening borders. Deep ditches surround the marshy meadows on every side, filled with various aquatic plants, among which *Scirpus maritimus*† forms a singular feature on one side, while other spots are adorned with the towering scape and beautiful umbels of the Flowering Rush (*Butomus umbellatus*), and the deep yellow flowers of *Lysimachia vulgaris*.

\* When the pastures are grazed and not mown, the *Enanthe pimpinelloides* develops itself very tall and luxuriant, as it then remains untouched by the cattle, though its stems must go to make up a considerable portion of the hay from these meadows.

† Mr. Watson in his "Cybele Britannica," in his somewhat capricious way, quotes Mr. W. S. Rufford a long deceased correspondent of Purton, as an authority for the *Scirpus maritimus* growing at Badsey, near Evesham; but suppresses my recent notice of it in the Malvern Botany.

Other rare moisture-loving plants are located here to tempt the exploring botanical foot. *Hippuris vulgaris* abounds in the shallow waters, and on grassy spots bordering the marshes *Enanthe silaifolia* (*peucedanifolia*, Smith,) forms a very remarkable feature at its flowering time in May. *Enanthe Lachenalii* grows both here and on the borders of Welland Marsh, though quite a late discovery. In the extensive flat meadows bordering on Castle-Morton, the Meadow Thistle (*Carduus pratensis*) makes a fine show; and here, creeping on the side of little damp hollows, I have found the very local *Lathyrus palustris*,\* its only habitat in our county.

Some of the more barren fields on the borders of Longdon Marsh exhibit the rare *Ranunculus hirsutus* occasionally, and in others *Carex intermedia* spreads a rough growth far and wide. In the flat pastures in this vicinity *Sanguisorba officinalis* is very plentiful. In the muddy ditches some species of *Chara* may be found.

Two remarkable plants may be also recorded as appertaining to this wet undrained district, which are unknown in any other part of Worcestershire, viz., *Utricularia vulgaris*, in a pool between Chaceley and Tirley; and the beautiful Water Violet (*Hottonia palustris*), which I gathered some years since when residing at Forthampton, near the footway to Chaceley, in a marshy spot opposite to the mansion of Joseph Yorke, Esq., Forthampton Court. The plant has since been observed (1851) by Alfred Kent, Esq., near to the turnpike gate, on the Malvern

\* I again renewed my acquaintance with the *Lathyrus palustris* here in company with the Rev. W. Thackwell, of Birts Morton, in 1850. It was also observed plentifully here by my friends T. Westcombe and J. H. Thompson, in 1853, but occurring in the damp hollows of grassy pastures, and flowering just at mowing time, it becomes a nice point for the botanist to catch it in its beauty. Though noticed by me many years since in the "Botany of Malvern," a copy of which I presented to Mr. Hewett Cottrell Watson, he has left out this plant from the Severn district, with several others, which he need not have done had he consulted its pages. His "Cybele Britannica," is thus not so correct as it might have been, and he exposes himself to the same censure he has often made on others, that of neglecting what had been previously remarked or observed.

side of Upton-on-Severn; and Mr. Beach, surgeon, of Cheltenham, has reported it as found by him rather plentifully in broad ditches between Upton Bridge and Southend Farm.

The Common Reed (*Arundo Phragmites*), of course forms a conspicuous feature of the Longdon Marshes, filling the wet ditches, and rearing its tall purple spikes and sharp lanceolate leaves in long extending rows with a noble effect. The Golden Dock (*Rumex maritimus*) also in some seasons grows here very luxuriantly.

I may here mention a rare and rather delicate plant that I have gathered not far from Longdon Church, and which once was not very uncommon, but seems now all but lost. This is the Green-leaved Hounds-tongue (*Cynoglossum sylvaticum*). In Ray's Synopsis it is mentioned on the authority of Mr. Pitts, as found in "shady lanes about Worcester," and Nash in the *History Worcestershire* gives the "3rd milestone from Worcester to Pershore" as its locality. No living botanist has found it near Worcester, and at the Gullet Glen, Malvern range, and Lower Lode Lane, near Tewkesbury, where I have gathered it formerly, it has disappeared, so that the probability is that it will become quite extinct with us.

#### PLANTS OF THE DROITWICH CANAL.

A curious feature in this division of the county is presented to botanical notice in the Droitwich Canal, which connects the Salt-works at that place with the Severn, and which for the six miles of its course is constituted of saline water, from receiving the waste brine of the various works in Droitwich. On its banks the pretty *Glaux maritima* and *Apium graveolens* flourish abundantly, as well as the littoral grass *Schlerocloa distans*. *Atriplex rosea* or *Babingtonii*, and *Lepidium rudemale*\* also occur, and it

\*I found this plant some years ago on a waste spot of ground much resembling a sea beach, not far from Porter's Mill; and in 1860 it was observed in great abundance in a lane leading to St. Peter's Droitwich, by my friend the Rev. J. H. Thompson. Here I saw it in 1862, still occupying the ground in great force. That it is not of recent origin in Worcestershire is evident from its mention in Withering's Botany, as being seen "above Worcester," by Dr. Stokes, in the last century.

is not improbable that more maritime species may be detected. On this subject a paper by Professor Buckman was read at the Meeting of the British Association in 1847. In that paper Mr. James Buckman has enumerated *Alsine marina* as also growing on the banks of the canal. But on a careful examination of the *Alsine* growing there, it appeared to me intermediate between *A. rubra* and *A. marina*. In so dubious a case, I transmitted a specimen of the plant to Mr. Babington, of Cambridge, author of the "Manual of British Botany," who considered it to be his *A. rubra* var. *media*, and the *Lepigonum medium* of Fries. It deserves perhaps to stand by itself, unless it is considered a variety of *A. rubra* made fat on its briny pabulum.

In addition to the above, the following species found in the Severn Valley, are either of marine origin or affect a saline habitat, and therefore deserve to be recorded.

*Lepidium latifolium*. On the banks of the Salwarp at Droitwich, and extending up the neighbouring railway embankment. The interesting discovery of this sea-side plant was made by our associate the Rev. J. H. Thompson, now incumbent of Cradley, in November, 1852. On inspecting the locality, though the plants on the railway embankment appeared of recent origin, yet old seedy plants by the side of the dingy Salwarp looked as if they had grown grimy there for many a year.

*Erodium maritimum*. On Mitton Common, near Stourport, both on the northern and southern sides; and at Habberley Valley, near Kidderminster.

*Polygonum Roberti*. On a little green or waste spot, in a lane near St. Peter's, Droitwich. This plant is closely allied to the sea-side Knot-grass (*P. maritimum*).

*Bupleurum tenuissimum*. At Red Hill, on the Nunnery Farm, a mile and a half from Worcester: also on Welland Common.

*Smyrniolum olusatrum*. Growing large and abundant at the foot of the marl cliff at the Mithe Tout, one mile north of Tewkes-



bury : and also at Hill Croome, a few miles north of that place, as recorded by Dr. Nash in his History of Worcestershire.

*Eranthe Lachenalii*. Occurring in some quantity in marshy spots about Welland, near Upton-upon-Severn ; and in Longdon Marsh ; also on Defford Common.

*Rumex maritimus*. Plentiful in the Longdon Marshes, and on the banks of the Severn below Worcester.—Spetchley Park, 1847, Mr. G. Reece.

*Samolus valerandi*. Gathered some years since at Battenhall, near Cruckbarrow, 2 miles south of Worcester ; and also on the side of a brook at Defford, two years since.

*Gastroidium lendigerum*. About Sarn hill, Bushley, two miles N.W. of Tewkesbury.

*Triticum laxum*.\* On the banks of the Droitwich Canal.

*Iris fetidissima*. This plant which prefers the vicinity of the coast, forms great thickets in Sarn-hill Wood, in the parish of Bushley, and is also abundant in a hilly wood called Swain's Bank Coppice, between Powick and Maddresfield. In other parts of the country it only appears as an occasional solitary plant.

The Burnet Rose (*Rosa spinosissima*), so ubiquitous in its dwarf state on the sandy coast, forms a beautiful shrub rather common about Worcester, and also adorns the sandy country in the vicinity of Kidderminster.

The less common plants not previously mentioned, observed in the Severn Valley, require enumeration, as being either restricted to a few localities, peculiarly characteristic, or found in no other part of the county. Probably some were but of transitory occurrence, though still deserving of notice.

*Clematis vitalba*. This plant though so generally partial to limestone, yet gets on the red marl at Battenhall and Hallow, and some other places near Worcester.

\* This *Triticum* is in Professor Buckman's list referred by mistake to *T. junceum*.

*Thaddeum flavum*. On the banks of the Severn in tufts here and there.

*Myosurus minimus*. The Mousetail is very local in Worcestershire. I found a few specimens in 1836, close to a small pond on Helbury Hill, but searched some years afterwards vainly for it. The *Rev. J. H. Thompson*, observed it near Portef's Mill, on the Droitwich Canal, most abundantly in 1852, though few plants are now left there.

*Ranunculus parviflorus*. Port Fields Road, Norton Road, &c., near Worcester.

*Berberis vulgaris*. Side of Comer Lane, St. John's, Worcester. Almost eradicated from the county.

*Papaver hybridum*. In a calcareous cornfield at Tibberton, about three miles on the eastern side of Worcester, where only I have seen it in the district.

*Chelidonium majus*. In Comer Lane near Worcester, and at Hallow, &c. Always near gardens, and no doubt an old domesticated plant.

*Barbarea præcox*. Side of a lane at Broadheath, St. John's. I presume a straggler from cultivation.

*Erysimum cheiranthoides*. Gathered "on the banks of the Severn, near Hallow." *Herb. of Worcester Museum*. An accidental wanderer.

*A Armoracia amphibia*. In shallow pools at Bromwich and Northwick, near Worcester. Not common.

*Lepidium Smithii*. Helbury Hill, near Worcester.

*Sisymbrium Sophia*. Northwick, near Worcester. *T. Westcombe*.

*Reseda suffruticulosa*. I once found this in waste ground in Britannia Square, Worcester, while the land was yet not fully laid out. Also found by Mr. Gissing in 1853.

*Viola hirta*. At Whittington, Henwick, &c., not confined to limestone. Varieties occur *not* hairy, scarcely distinguishable from *V. odorata*, except as scentless.

*Saponaria officinalis*. On the banks of the Severn near Bewdley, &c. Also on Severn side at Grimley.

*Dianthus Armeria*. At Hallow and Battenhall, and gravelly banks near Upton, &c. Not common, and very fugacious.

*Hypericum Androsæmum, dubium, pulchrum, quadrangulum, hirsutum, and humifusum*.

*Geranium striatum*. This appeared on the stone embankment fronting the new esplanade of the Severn, in 1852.

*G. pyrenaicum*. Abundant on the side of Dodderhill, near Droitwich; and on the bank of a meadow at St. John's, Worcester, on the pathway from Mudwall Mill to the Bransford road.\*

*G. lucidum*. Pretty common about Worcester, as at Merryman's Hill, Barbourne, &c.

*Rhamnus catharticus*. A very common tree in the vale of Severn, and growing to a considerable size on the banks of Laughern Brook.

*R. Frangula*. Ockeridge Wood, and Birchin Grove, near Worcester. Very local.

*Euonymus europæus*. Of general occurrence in bushy places.

*Genista anglica*. On Broadheath, and at Moseley Green, near Monk Wood. Now rare.

*Medicago maculata*. Banks of the Salwarp, near Porter's Mill, and on the grassy walk in Mr. Smith's large hop yard, at Wick, near the Severn. Introduced of late years, I believe, at both spots, but abiding there.

*Melilotus officinalis*. On the embankment of the Midland Railway: plentiful.

\*Accounted "dubiously indigenous in England," by Mr. Watson in his "*Cybele Britannica*," but in the above mentioned spots it has an appearance as wild and spreading year after year as the common black horehound.

*Trifolium fragiferum.* Near Croome Perry Wood, and abundant about Besford. Near Tibberton and Warndon.

*Astragalus glycyphyllos.* On Helbury Hill, and near Thrift Wood.

*Vicia bithynica.* Under Crookbarrow Hill, in 1852 and 1854, where it was gathered by Mr. T. W. Gissing, now of Wakefield.

*Vicia gracilis.* At Tibberton and Powick, near Worcester.

*Lathyrus Aphaca.* Abundant year after year in Norton Field, three miles S. E. of Worcester. Pointed out by Mr. T. Baxter,

*L. Nissolia.* The beautiful crimson "Grass Vetch" flourishes at the same spot. Also at Temple Laughern, Henwick, and near Helbury Hill. Near Hawford Mill.—T. W. Gissing.

*L. sylvestris.* Helbury Hill and Perry Wood. Also at Hazlewood, near Hadsor.

*Onobrychis sativa.* Calcareous marly bank at Tibberton, constant.

*Prunus Avium.* Wild Cherry. In woods at Holt and Ombersley.

*Potentilla argentea.* Astley, near Stourport; on the sand rock between Bromsgrove and Droitwich; on red sandstone at Holt; and on the road-side between Worcester and Ombersley.

*Rubus Idaeus.* In Shrawley Wood. Plentiful in damp spots near Kidderminster.

*Rubus carpinifolius.* This bramble is rather abundant about Kidderminster, while it is not found in the southern part of the county.

*R. suberectus.* Birchin Grove, St. John's; now rare. The other *Rubi* may be more conveniently arranged together in the appendix.

*Rosa Sabini* var. *Deniana.* At the western base of Crookbarrow Hill, abundant; and on the edge of Warndon Wood.

*Rosa villosa and tomentosa.* Helbury Hill, Battenhall Lane, between St. Peter's Droitwich and Hadsor, near Bromsgrove, &c. Not uncommon.

*R. rubiginosa.* Near Cruckbarrow Hill, Worcester, &c.

*R. inodora.* Perry Wood, and other woody spots. Also near Himbleton.

*Rosa systyla.* In a hedge near Sand Pits, Powick. Rare.

*Pyrus communis and Malus.* Scarcely any of our woods are without the Crab; but the Pear-tree occurs very sparingly, nor have I noticed any seedlings in hedges. But then this is just the case with *Pyrus torminalis*, which is quite as aboriginal as any British tree. Once, and once only have I met with a wild Pear-tree in flower, and this was in Crow's-nest Wood, St. John's. No very old trees occur any where.

*P. Aria.* In Wyre Forest, but rare, and pollarded among bushes.

*P. torminalis.* Helbury Hill, Perry Wood, and sparingly in every wood.

*Myriophyllum verticillatum.* Northwick Pool, &c.

*M. Spicatum.* In the canal at Worcester, and small ponds.

*Sedum Telephium.* Close to Laughern Brook on a hedge bank in a field above Bubble Bridge, growing very tall. Shrawley Wood, and Hurcott Wood, near Kidderminster.

*Ribes rubrum.* By the side of Laughern Brook in several places, but brought down the stream, no doubt, from mill gardens. Ori's Coppice, Rushwick, and Hurcott Wood, Kidderminster, might seem more likely places for it to be indigenous, but as it sometimes appears as an epiphyte on willows, this is doubtful. I have observed it abundantly on the side of a brook below Madresfield, but currant bushes are so often rooted up from gardens, that the mere current may have brought them down there.

*R. nigrum.* The black currant, which is often found on ditch banks by the Severn side, and in coppices at Hartlebury, seems

more likely to be indigenous than the red; but I would not guarantee it as a true native. *R. grossularia* is in all cases a mere outcast, or propagated by birds.

*Saxifraga granulata*. In meadows by Laughern Brook at Henwick; Canal side near Astwood; meadow by Barbourn turnpike gate. Between Hartlebury Common and the Church.

*Chrysosplenium alternifolium*. Ors Coppice at Rushwick.

*C. oppositifolium*. Common in swampy places, as near Battenhall, at Hallow, &c.

*Petroselinum segetum*. Dodderhill near Droitwich; between Henwick and Hallow; Spetchley, &c. Not uncommon.

*Sison amomum*. On the red marl, not uncommon about Worcester. Native.

*Carum Carui*. Powick. Mr. T. Westcombe. An offcast of cultivation, no doubt.

*Pimpinella magna*. Rather plentiful about Droitwich, and Hadsor, and occasionally on the Droitwich Road near Barbourne. Mr. W. Mathews has gathered it in Wyre Forest also. Near Helbury Hill.—T. W. Gissing.

*Sium angustifolium*. Rare in this district. Messrs. T. Baxter, T. Westcombe, and G. Reece, testify to its occurrence about little pools at Wick, near Powick. In a ditch opposite "Camp." —Mr. Gissing.

*Sium latifolium*. "Blakedown Pool, near Stourbridge. T. P." According to the initials annexed, Purton would seem to have gathered this plant himself; but no one else has met with it there.

*Bupleurum rotundifolium*. An agrarian occurring yearly in the calcareous marl field at Tibberton, so well known to our Worcester botanists. Also at Churchill, near Worcester.

*Eranthe peucedanifolia*, Smith, or *Æ. silaifolia*? Bieb. Plentiful in the moist meadow under Kempsey Grove; and on Kempsey Ham. Severn Ham, Tewkesbury.

*Æ. Lachenalii.* Borders of Longdon Marsh.

*Æ. crocata.* Near Stourport, and not uncommon in wet ditches by the Severn below Worcester. *Æ. Phellandrium* is rather common.

*Feniculum officinale.* A quantity of this plant was noticed in a clover field, beyond Powick Church, "three fields to the south," in July 1846, according to a mem. made on a leaf of the Herb. Natural History Society, with a specimen of the fennel. No doubt the seed had been conveyed there, either sown with the clover, or taken in manure. On the Keuper marl cliff at Crowle, semi-naturalized, 1857.

*Silene pratensis.* An unexceptionable native, occurring in many upland meadows abundantly, and about Worcester.

*Archangelica officinalis.* In one of the meadows below the Priory Ferry, Worcester, on the Wier side. Mr. G. Reece in Herb. Worcest. Nat. Hist. Soc., September 1845.

*Pastinaca sativa.* So characteristic is the parsnip of the *red marl* in Worcestershire, that every waste marly place generally abounds with it. In cuttings of the railway plentifully.

*Daucus Carota.* Almost as abundant as the parsnip, but more attached to a calcareous soil, as at Tibberton.

*Heracleum Sphondylium.* This rank weed is too numerous in our meadows as an undeniable native.

*Caucalis daucoides.* Very rare. Found in the calcareous corn field at Tibberton; due to the research of Mr. T. W. Gissing.

*Torilis infesta.* Port Fields, and other places about Worcester.

*T. nodosa.* Rainbow Hill, Henwick, &c., not rare.

*Adoxa moschatellina.* On the margin of Laughern Brook, plentiful. Not much dispersed in the district.

*Viscum album.* All through the Severn Valley, chiefly on Apple and Hawthorn. Of late years wherever the Italian Black Poplar is planted, the Mistletoe is sure to seize upon it in a short

time. It is rather partial also to the Lime and Maple, and I have once seen it on the Elm and Service. It occurs on the Pear tree very rarely indeed, but I have observed two instances. Occasionally it appears on the Ash and the Willow. Less plentiful in the northern part of the county.

*Sambucus Ebulus.* (Danewort.) Between Ripple and Stratford Bridge, in the southern part of the Severn Valley (1855), and it was noticed in "Ripple Field" by Mr. Ballard as recorded in Withering, more than half a century ago. Occupying the side of a hedge at Lower Wick for about fifteen years to my knowledge, and perhaps centuries before. *Mr. H. C. Watson* in his "Cyb. Britt." mentions it as only in "suspected places;" but these suspected spots are generally obscure enough to take away any idea of its wilful introduction by man. Tradition indeed carries it back to Danish times, and Warsae in a grave book on Antiquities, says that after a slaughter of the Danes at Warwick in Canute's time, a great quantity of the plant sprung up there, as if from Danish blood. It would be curious enough if it could be shown that the *Sambucus Ebulus* followed the *foot-steps* of the *Danes*, and was brought over with them.

*S. nigra.* Common enough in hedges, but scarcely in woods. Perhaps introduced originally.

*Viburnum Lantana.* Mostly a limestone tree, but a few stragglers get on the marl, as on Red Hill, and near Berwick's Bridge. Truly Native.

*Lynocera Xylosteum.* At Powick; in a bushy place by Westwood Pool; copse on the eastern side of Hartlebury Common; and in a thickety spot on the eastern side of Longdon Marsh. Rare.

*Asperula odorata.* In most of our upland woods.

*Galium tricornue.* In the calcareous field at Tibberton, growing taller than I have elsewhere seen it.

*Centranthus ruber.* On old walls about the cathedral.



*Dipsacus pilosus*. By Bubble Bridge; Oris Coppice, Rushwick; Powick; &c. Not uncommon.

*Erigeron acris*. Near the Chapter House, College Green; and on the walls of Leigh Church-yard. A wanderer.

*Helminthia echinoides*. Helbury Hill, Bredicot, &c., not confined to limestone.

*Inula Conyza*. Between Broadheath and Cotheridge; under Cruckbarrow Hill, &c. In dry places, not confined to limestone, and pretty general.

*Anthemis arvensis*. In cornfields, not very uncommon.

*Tanacetum vulgare*. Most abundant on the banks of Severn, both above and below Worcester; near Bewdley also; and in Petiford Lane east of Kidderminster, according to the observation of Mr. W. Mathews. Perhaps nature has taken it up after being expelled from gardens, and no longer wanted for Tansy Pudding. It certainly has much extended itself in modern times.

*Filago apiculata*. Near Hartlebury Common. I give this critical species on the authority of my friend Mr. T. Westcombe.

*Gnaphalium sylvaticum*. Sometimes abundant in woods for a time, and then disappearing. Plentiful in Shrawley Wood in 1847 and 9. Afterwards scarcely a plant to be found there for some years. Bisshill near Kidderminster.

*Centaurea nigra* and "*nigrescens*." In meadows at Warndon, &c. Surely the latter has nothing but its "radiant" flowers to distinguish it from *C. nigra*. Very general in both forms.

*Centaurea Scabiosa*. Calcareous field at Tibberton; and on the red marl about Upton, Longdon, &c.

*C. Cyanus*. Occasionally in cornfields, but not common.

*Onopordum Acanthium*. About Henwick, Claines, Norton, &c., always on the borders of cultivation, perpetually disturbed, yet reappearing again and again.

*Carduus eriophorus*. Not common. Single plants at Kempsey Grove, and Hill Top, Cotheridge. A few years since quite a colony sprung up in the shrubbery adjoining Mr. Morgan's, Terrace House, Powick, and close to the road: but though an ornamental plant, I believe few remain there now.

*Cnicus pratensis*. In a wet meadow between Tibberton and Crowle (1856.) Also in meadows of Longdon Marsh. Become very rare.

*C. Forsteri*. I believe this plant has scarcely been found out of Sussex; but on July 9, 1856, on returning from a meeting of our Club, who had been exploring the vicinity of Himbleton and Huddington, in passing through the low flat meadows between Etherwood and Tibberton, I discovered a small patch of this curious hybrid thistle. It grew much taller than *C. pratensis*, with a wide-extended panicle clustered at the summit, having leaves much like those of the Marsh Plume Thistle (*Cnicus palustris*), an unwinged cottony stem nearly similar to that of *C. pratensis*, but with flowers most like those of *C. arvensis*. Towards the brook side the meadow was crowded with deep purple lofty stems topped with crowded flowers, of *C. palustris*; and the hybrid *C. Forsteri* grew in a part of the field intermediate to the positions taken up by *C. palustris* and *C. pratensis*, the latter being farthest from the brook, and on the western side of the field.

*Silibum Marianum*. Appearing at intervals in waste spots as chance favours it, and soon lost again.

*Cichorium Intybus*. On the side of the railway at Abbot's Wood; and at Huddington, Bredicot, Rainbow Hill, &c., always on the skirts of cultivation.

*Tragopogon minor* and *pratensis*. Plentiful, mostly in the former form; but the length of the involucre is no character to depend upon, as in *both* vars, if there are such, the involucre is *longer* than the florets at their first expansion. I once found a singular very small-flowered plant near Shrawley Wood, with short involucre.

*Lactuca muralis*. Near Birchen Grove; and pretty general in shady holloways all through the Severn Valley.

*Orepis virens*. Common every where. A curious var. gathered by Mr. G. Reece below Holt Bridge is in the Herb. of the Worcest. Nat. Hist. Soc. having excessively numerous flowers, and very long leaves distantly cut.

*Hieracium murorum, vulgatum, boreale, and umbellatum*, all occur, the latter but rarely, as in Crowsnest Wood. The vars. of *H. vulgatum* are puzzling, and require close examination.

*Jasione montana*. Common in the sandstone country, but not so in the southern or marly part of the Severn valley.

*Campanula latifolia*. Shrawley Wood. On the banks of Laughern Brook, in Boughton Fields near Worcester, but rare.

*C. Trachelium*. Of very frequent occurrence in woods and their borders.

*C. patula*. Often very abundant in our woods, and indeed a wide-spread plant in Worcestershire. Helbury Hill, Shrawley Wood, Perry and Nunnery Woods, Oldbury Lane near St. John's; as well as lower down the Severn, at Dripshill.

*Specularia hybrida*. In the calcareous field at Tibberton. Mr. Watson in his "Cybele," remarks it as not reported from Monmouth or Worcester, and considers it as "native." It is certainly very local in Worcestershire, nor have I ever seen it but in calcareous places in suspicious agrarian company.

*Erica Tetralix*. This pretty species grows on Broadheath, near Worcester, its most southern station in the county. Both it and *E. cinerea* are quite absent from the Malvern district and the southern part of Worcestershire. Even *Calluna vulgaris* becomes rare in both districts, though plentiful in the north part of Worcestershire.

*Ligustrum vulgare*. Abundant in hedges, though scarcely more than "a denizen."

*Vinca minor*. Base of Cruckbarrow Hill within a copse; at the side of lanes about Powick; on Clerkenleap Bank, &c., fully established if not truly indigenous.

*Lycopsis arvensis*. Side of roads at Henwick, Hallow, Northwick, &c.

*Simphytum officinale*. On the Severn banks. The purple-flowered var. predominates.

*Orobanche minor*. Among clover at Lower Wick (1849). Uncertain in its appearance, and a mere "colonist."

*Verbascum nigrum*. Uncommon.\* On the bank of the canal at Salwarp, and by the Severn near Bevereye.

*Antirrhinum majus*. On old walls at Worcester, &c., straggling from gardens, and never far from them.

*A. Orontium*. At Barbourne, Cotheridge, &c. Rather rare.

*Linaria Cymbalaria*. Old city walls; and walls at Bevereye, &c. Long naturalised.

*L. spuria* and *Elatine*. In the calcareous field at Tibberton, which is quite a Paradise for Agrarians. Both these are increasing.

*Veronica montana*. In coppices at Powick, and Hallow; also at Orls Coppice, Rushwick. Partial to shade.

*V. scutellata*. Moseley Green near Hallow; and Northwick brick pits, near Worcester.

*V. polita*. A weed at Lepard and other spots near Worcester. An interloper.

*V. anagallis*. Not uncommon in pools and ditches.

*Mentha sylvestris*. By the side of the brook near the "New Inn," on the Ombersley Road. Doubtless a native, but rather rare. Also near Kidderminster.

*M. rotundifolia*. By the road side near Stone, on the Bromsgrove road from Kidderminster, where only I have found it in the Severn Valley. Near Bewdley, Mr. G. Jordan.

*M. sativa*, var. *acutifolia*. I refer here a specimen in the Herb. Nat. Hist. Soc. gathered by Mr. Reece, the sub-curator, and there named *M. gentilis*—which may be near enough.

*M. piperita*. Close to Dane's or Dinas Green, Henwick. I think it to be native at this spot, which is similar to the wet places about Malvern, where it is abundant.

*Salvia verbenaca.* On red marly banks about Worcester, as on the side of the London and Crowle roads. Very restricted in its habitats.

*Calamintha officinalis.* On dry banks not uncommon. Cowmore Lane, St. John's; Grimley, and other places.

*C. sylvatica?* (Bromfield.) In the Herbarium of the Worcester Nat. Hist. Soc. is a remarkable specimen that appears to me to be very similar to the *C. sylvatica* of Dr. Bromfield. It was gathered by the late Dr. J. M. Streeten of Worcester, on "Abberley Hill, 16th Aug., 1844." The doctor has referred it with doubt to "*Calamintha grandiflora*, Moench.?" It appears to me much to resemble *C. sylvatica*, and the point is worth attention. Only one specimen seems to have been gathered, and nothing similar has fallen under my own notice.

*Marrubium vulgare.* Road side at Grimley. Mr. T. W. Gissing. A local plant.

*Scutellaria galericulata.* On the banks of the Severn in various places; by Laughern Brook; marsh by Kempsey Grove, &c.

*Nepeta cataria.* Plentiful in gravelly places, but quite a wayside plant. Near Stourport, Witley, and Worcester.

*Lamium amplexicaule.* Common as an Agrarian, especially in sandy fields near Worcester. Also near Kidderminster.

*L. incisum.* On a hedge bank near Earl's Court, St. John's, but rare.

*Galeopsis versicolor.* Hurcott near Kidderminster, 1847. Mr. G. Reece, in Herb. Nat. Hist. Soc. Very rare in Worcestershire.

*Verbena officinalis.* Not uncommon as a waysider, though a rural one. Perhaps a wanderer with man, like the nettle.

*Primula vulgaris*, var. *caulescens*. This, generally known as "the Oxlip," is common enough, but it is not the same as the Eastern Counties Oxlip. However I have met with very strange varieties nearer the cowslip than the primrose, whether hybrids or sportive seedlings I can scarcely say. Both kinds probably occur.

*Lysimachia vulgaris*. Side of the Severn near Kempsey, and at Longdon Marsh; but rather uncommon.

*Anagallis cærulea*. In the calcareous field at Tibberton. I have received a white flowered var. from Astley. The red *A. arvensis* occurs in every fallow.

*Samolus Valerandi*. I have this in my own herb. which I gathered many years since (1828), by a rill at Battenhall, near Worcester. Also at Defford, with the Rev. J. H. Thompson.

*Chenopodium polyspermum*. In waste spots at Claines; and near Henwick Mill Pond. *C. murale*. This grows about Worcester.

*C. urbicum*, *album*, and *rubrum*. All occurring here and there.

*C. Bonus-Henricus*. At Turquay, Worcester; Tibberton Church-yard, &c. Always near the living or dead.

*Atriplex patula*, *angustifolia*, *erecta*, and *deltoides*. Also the var. of the latter called *microsperma*. The two latter at Diglis, and other spots near Worcester.

*Rumex palustris*. In the Southern part of the Severn Valley. Rare.

*R. sanguineus*. The green var. *viridis* only met with according to my own observation, and even that is not common. Hadsor, &c. More frequent about Kidderminster. Mr. W. Mathews.

*R. Hydrolapathum*. This fine dock adorns the Severn banks and pools near them in many places, as at Henwick, towards the mouth of the Teme, &c. Also at Longdon Marsh.

*R. pratensis*. On Wannerton Downs near Kidderminster. Mr. W. Mathews.

*R. pulcher*. At Dodderhill Church-yard, Droitwich. Rare.

*Polygonum lapathifolium*. Occasionally appearing in fallow fields.

*P. mita*. In a wet place near the Severn, Worcester, also in Boughton Fields. G. Reece. Not often found.

*P. aviculare*? A var. of this closely approximating to *P. maritimum* was brought to me by Mr. T. Lewis, a member of the club, from the soil thrown up at the Diglis cutting.

*Callitriche platycarpa*. At Northwick, near Worcester. Mr. T. Westcombe.

*Ceratophyllum submersum*. This with *unarmed* fruit is plentiful in Northwick Pool, and is the more common species in ponds. *C. demersum* occurs at Spetchley, and is perhaps as common as the other hornwort.

*Urtica dioica*. Generally held to be aboriginal from its being as Mr. Watson says in his "Cybele," (ii. p. 369.) "abundantly common throughout Britain." But seeing how soon a frost cuts it up in this climate, and how everywhere it follows man about, there is good reason to suspect that it is a pestilent intruder, whose irritable manners came in from a far country, though now of course endured *ex necessitate rei*! Some time since I was amused to see how the Nettle by degrees covered a fine pasture near Worcester, as the advance of houses slowly surrounded the field. It got at last the complete mastery of the grass and reigned supreme. The owner was obliged to give up the field as meadow ground, and turn it into gardens.

*Humulus Lupulus*. Very common now in the Severn valley even in secluded copses, but I should hold it a debatable point, if really so in ancient British times, and it cannot perhaps now be determined. The male Hop is not very frequent.

*Ulmus suberosa*, Ehrart. (*U. campestris*, Smith). Worcestershire is now overgrown with the common Elm, though there is no doubt of its introduction to Britain centuries ago. I never saw it in a native wood; but once planted in a hedge or field, the suckers arising from the roots rise up so fast and numerous after the original trunk is cut down, that it is almost indestructible.

*Ulmus carpinifolius*. This species or variety first observed by Dr. Lindley, seems now given up by Babington, though the

leaves are very remarkable. At Northwick, near Worcester, but I presume planted there.

*U. montana*. Very general in old hedges and borders of woods, where from lopping its head often assumes formidable dimensions. Native.

*Populus tremula*. The Aspen is an inhabitant of every lowland wood in Worcestershire, though not in much abundance either.

*Quercus robur* and *sessiliflora*. The former is most abundant. *Q. intermedia* in Wyre forest.

*Corylus avellana*. In every bushy wood, more or less.

*Taxus baccata*. The Yew appears to be quite indigenous on the Abberley Hills, and even descends to the wooded marl banks of the Severn. Seedlings stud the old walls of the garden at Holt Castle.

*Juniperus communis*. At Bush Hill, Powick. Rare. Perhaps formerly more common, as Leland mentions it as covering Towbury Hill, an old earthwork near Ripple, temp. Henry VIII., though not a bush remains there now.

*Paris quadrifolia*. Not common in lowland woods, but growing in Croome Perry Wood, and a copse at Cruckbarrow, near Worcester.

*Tamus communis*. Tolerably plentiful in hedges.

*Hydrocharis Morsus-ranæ*. In pools close to Worcester, on the western side; at Kempsey Grove; near Upton-on-Severn, &c.

*Orchis Morio* and *mascula*. The former plentiful in dry meadows, as near Monks Wood, Warndon, &c.

*Orchis maculata* and *latifolia*. The former excessively common in dampish places; the latter rather local, and affecting *very wet* spots.

*O. pyramidalis*. The beautiful Pyramidal Orchis is not entirely confined to limestone, as a few years since I met with it in Berwick's Brake near Worcester; and Mr. Gissing gathered it



at Cruckbarrow Hill in 1853; but not abiding in either place. This may show how other and rarer plants make an occasional appearance, which they cannot maintain. In meadows near Himbleton, but close to the Lias formation.

*Gymnadenia conopsea*. Not of common occurrence. At Saldon near Himbleton, though this is on the confines of the Avon or Lias district. At Stoulton, in a meadow next the railroad.—Mr. T. W. Gissing. At White Lady Aston, 1847. Mr. Suttle.

*Habenaria viridis*. Battenhall near Worcester. At Cotheridge. John Walcot, Esq. Rather uncommon.

*H. bifolia*. On Woodbury Hill, Witley. The smaller Butterfly Orchis is confined to hilly and rather exposed places, and not often met with.

*H. chlorantha*. At Witley, and also at Bush Hill, Powick. Not very common in the Severn Valley.

*Ophrys apifera*. The Bee Orchis is almost invariably confined to limestone, yet very rarely it advances on other soils, and a few years since a single specimen was found at Red Hill, near Worcester, by the Rev. H. Havergal. At Crowle, but there it is close to or within the Lias district.

*Neottia Nidus-avis*. In Shrawley Wood, and Habberley Wood. Rather rare.

*Spiranthes autumnalis*. On the great mound of Cruckbarrow.

*Epipactis latifolia*. In a shrubbery near Pull Court, Bushley. Specimen sent by J. C. Kent, Esq., 1855. Northwick, according to Herb. Nat. Hist. Soc. Very uncommon in the Severn Valley Woods. Witley Court Plantations according to Mr. W. Mathews.

*Epipactis purpurata*, Smith, or *E. media*, Fries. Found by our observant associate, Mr. T. Baxter, in Nunnery Wood, Worcester.

*Cephalanthera ensifolia*. In Witley Court Plantations.

*Iris fetidissima.* Western base of Cruckbarrow Hill. Uncommon. Plentiful on Sarn Hill, Bushley.

*Narcissus biflorus.* Rare. In an orchard beyond the Ketch, naturalized. Also at Baynall, near Kempsey. Dr. J. M. Streeten.

*N. Pseudo-Narcissus.* Severn meadows at Kempsey. Dr. Streeten. Plentiful in a wood called Callion's Wood, about two miles west of Wadberough. At Norton juxta Kempsey is a "Daffodil orchard," where the var. *plena flora* grows, but I presume of garden origin.

*Convallaria majalis.* Shrawley Wood. A few plants still remaining in Birchin Grove, near Henwick. 1855. A true "native."

*Ornithogalum umbellatum.* Naturalized on Pitchcroft, though of extraneous origin.

*Allium vineale.* Abundant at Tibberton, and on Pitchcroft; in fact more or less plentiful in the meadows of the vale of Severn.

*A. oleraceum.* Somewhat rare. On the Ketch Marl Bank. Also at the base of Cruckbarrow Hill. Mr. T. W. Gissing.

*A. ursinum.* Common in damp copses. A characteristic native.

*Colchicum autumnale.* In meadows all through the vale of Severn, from Bewdley to Tewkesbury. Too abundant.

*Juncus effusus, conglomeratus, acutiflorus, lamprocarpus, supinus, compressus, Gerardi, bufonius.*

*J. glaucus.* Astwood-road and Monkswood. Mr. G. Reece. Not very common.

*J. squarrosus.* Broadheath. Become now much restricted.

*Luzula sylvatica.* Shrawley Wood, Birchin Grove, &c. Frequent.

*L. pilosa.* Birchin Grove, Helbury Hill, Crowsnest, &c.

*L. Forsteri.* Perry Wood, and lane near Birchin Grove. Rare.

*L. multiflora*. Monks Wood, Birchin Grove, and other heathy spots. Not very uncommon.

*Sagittaria sagittifolia*. Marshy pool at Camp above Worcester. More or less dispersed in the waters of the Severn Valley, although not common.

*Butomus umbellatus*. Canal side, Worcester, Henwick Mill-pond, &c., much increased of late years. Also in the canal near Kidderminster.

*Triglochin palustre*. Side of Laughern Brook; close to the canal at Merriman's Hill. Droitwich canal side.

*Typha latifolia* and *angustifolia*. Both abundant. The latter surrounds a pool at Hawford, near the mouth of the Droitwich canal, where several curious divided and double-headed varieties have been gathered. I have observed forms quite difficult to distinguish, and suspect they glide into each other by intermediate grades.

*Sparganium ramosum*, *simplex*, and *minimum* (*natans*, Sm.). I have seen the latter only from a muddy pool at Cotheridge, where Mr. Walcot says it is now lost.

*Lemna trisulca*, *minor*, *polyrrhiza* and *gibba*. The latter is quite frequent in pools and ditches.

*Potamogeton natans*, *oblongus*, *rufescens*, *lucens*, *perfoliatus*, *crispus*, *gramineus*, *pusillus*, and *pectinatus*. These are all I can certainly enumerate as growing in the Severn Valley waters, though probably more may be yet detected. Purton mentions *P. compressus* as "in the ditches near Abbots Moreton," which however belongs to our Lias district.

*P. zosterifolius*. This Pond-weed has been detected in Blakedown Pool, near Kidderminster, by my friend Mr. Westcombe, and may probably occur in other pools.

*Zannichellia palustris*. In Diglis Basin, as well as various ponds and ditches. Of general occurrence.

*Scirpus sylvaticus*. This is an abundant plant in marshy spots throughout the Severn Valley.

*S. carinatus*. Purton puts this down in his "Midland Flora," as growing at Chickhill Pool, near Enville, which is so close to the Worcestershire border, that if correct, there can be little doubt that other pools near at hand within the county must also have the plant.

*S. Tabernæmontani*. In watery spots in Knapp's Brick Grounds, Northwick. Herb. Nat. Hist. Soc. Various aquatic plants now find a home in the water-holes and excavations about Northwick, near the Severn. I know not how long bricks have been made here, but the plants must have migrated from some other place.

*Eleogiton fluitans*. In small ponds and ditches.

*Isolepis setaceus*. In Monks Wood. Mr. G. Reece in Herb. Nat. Hist. Soc. Not common.

*Eriophorum angustifolium*. Very uncommon now in the the Severn Valley. Bog on Hartlebury Common. Stone, near Kidderminster, 1839. J. Beynon, Esq. Probably now gone from the latter place.

CARICES. Several Carices generally considered rare, lurk in drains and ditches in obscure spots in the low wet borders of the vale near the Severn, as *C. intermedia*, *C. Curta*, *C. elongata*, *C. strigosa*, *C. fulva*, *C. binervis*, *C. Pseudo-cyperus*, *C. ampullacea*, and *C. vesicaria*. *C. vulgaris*, *C. stricta*, and *C. acuta*, may all be found in the marshy spots about the brick-grounds at Northwick. The universal common ones need not be mentioned.

*C. axillaris*, I give on the authority of Mr. Thomas Westcombe, as occurring at Norton, near Kemsey. Mr. Westcombe has also gathered *C. montana* in Wyre Forest. Mr. Jordan reports *C. digitata* from North Wood, Bewdley, but this last I have not seen. *C. paniculata* is reported by our observant secretary, as in great abundance in the pool ends, between Blakedown and Kidderminster.

GRASSES.—Some of the less common grasses must be mentioned, though I am not aware that our Severn meadows present any thing peculiar. Where an old bit of heathy moist ground yet remains in the midst of cultivation, as the remnant of Broad Heath, St. John's, there *Molinia cœrulea*, *Nardus stricta*, *Aira flexuosa*, and *Triodia decumbens*, present themselves. In woody spots *Milium effusum* and *Poa nemoralis* are sparsely scattered, while *Bromus erectus* and *Koeleria cristata*, appear in hilly somewhat calcareous spots. *Bromus diandrus* is said to have occurred at Severn Stoke on good authority, though the date is somewhat distant. Wet low spots exhibit *Phalaris arundinacea*, *Phragmites communis*, *Catabrosa aquatica*, *Glyceria aquatica*, *G. fluitans* and *plicata*. Recently *Lolium Italicum* through being cultivated has become partially naturalized, and occasionally *Setaria glauca* and *Phalaris canariensis* appear for a season or two, but only to die away. The less common grasses in our pastures are *Bromus commutatus*, *Avena pubescens*, and *Hordeum pratense*. In dry hilly places *Aira præcox* and *caryophyllea*, *Festuca ovina* and its vars., as also *F. bromoides*, and *Schlerochloa rigida* appear. *Poa compressa* is not very uncommon. *Festuca loliacea* has been gathered near Worcester.

With regard to *Festuca elatior*, which I have occasionally gathered in hilly meadows in the Severn Valley, considerable doubt has existed whether the plant so-called should be referred to the *F. arundinacea* of Schreb. or to the common *F. pratensis*, as a var. Mr. Watson in his *Cyb. Britt.* (iii. p. 222,) suggests that *arundinacea* and *elatior* should be joined together as one species, "*pratensis* and *loliacea* being the other." But my acute friend Professor Buckman tells me that all three forms are found by experimental growth in the College Garden at Cirencester, to emanate from *F. pratensis*, to which they must be referred. Gigantic indeed as the coast grass "*arundinacea*" generally is, specimens of "*elatior*" quite as large have been sent me from Stratford by Mr. W. Cheshire, Jun.

As the sandstone and marly heights on the banks of Severn are less than one hundred feet above the level of the sea, and any detached hills of the Keuper marl do not exceed 400, mere altitude can here exercise no influence on vegetation of any account; yet even within the thirty miles that the Severn Valley occupies in Worcestershire, aspect and exposure makes some difference, and thus the bleak table land of Hartlebury Common in the north, has quite a sub-alpine appearance, covered with a thick growth of *Calluna*, as well as *Erica cinerea* and *E. tetralix*; the two latter species being absent from the south of the county, and not occurring within the Malvern district. Here also two species of *Lycopodium* now flourish, and a third has been formerly found, while the *Lycopodia* are not seen in our county south of Hartlebury, nor is a single species seen among the defiles of the Malvern Hills. So the woods around Habberley Valley and the shades of Wyre Forest, produce the Bilberry, (*Vaccinium Myrtillus*), most abundantly, though it is not found in the woods lower down the river.

Wyre Forest though much diminished in extent, yet remains almost the sole depository of the unmixed indigenous vegetation of this part of England, and retains many plants extinguished where cultivation reigns supreme. A preceding list may be referred to, and it will be here sufficient to mention some of the plants not elsewhere found in Worcestershire. These are *Thalictrum minus*, *Geranium sylvaticum* and *sanguineum*, *Stellaria nemorum*, *Pyrola rotundifolia*, *Gentiana campestris*, *Rubus saxatilis*, *Epipactis palustris*, *Melica nutans*, and *Carex montana*. *Spiranthes aestivalis* has also been once found on the borders of the great bog in the forest, where *Eriophorum latifolium* flourishes abundantly.

The light sandy soil of the country surrounding Kidderminster and Stourport, is favourable to the growth of many plants either unknown or rare in other parts of the county, as *Turritis glabra*, *Sysymbrium Sophia*, *Erigeron acris*, *Jasione montana*, *Trifolium arvense*, *Thymus Acinos*, and several species

of *Verbascum*, as *V. nigrum*, *V. virgatum*, and *V. Lychnitis*.\* The loose sand upon Mitton Common near Stourport is almost covered with *Teesdalia nudicaulis*, and here also, *Cerastium semidecandrum*, *Hypechæris glabra*, *Ornithopus perpusillus*, and *Filago minima*, find an appropriate home. Another local plant here is *Vicia lathyroides*, which unless sparingly about the Malvern Hills, is no where else seen in the county. The showy Viper's Bugloss (*Echium vulgare*), though common enough in the north of Worcestershire, is scarcely to be found in the southern part of the county. *Dianthus deltoides* is now confined I believe, to Blackstone Rocks, near Bewdley. In the sandstone country near Kidderminster, where ravines among the hills have long been occupied by pools of water, some aquatics yet maintain themselves, found either not at all or very rarely elsewhere in the county. These are *Comarum palustre*, *Menyanthes trifoliata*, *Viola palustris*, *Radiola millegrana*, *Drosera rotundifolia*, *Scutellaria minor*, *Rhynchospora alba*, *Carex elongata*, *curta*, *paniculata*, and *ampullacea*. Mr. Scott has also mentioned *Littorella lacustris* as growing at Pensnet Reservoir, near Stourbridge. He could scarcely be mistaken in this, but I know not of any subsequent gathering of it there.

The deep shadowy lanes among the sandstone about Hartlebury, Cookley, &c., are favourable to the production of Cryptogamic species, but these have not been fully investigated. I may, however, mention *Anthoceros punctatus* as growing in a lane close to Wannerton Downs, and *Targiona hypophylla* and *Marchantia hemispherica* on the damp rocks near Hartlebury. *Blasia pusilla* and *Jungermannia epiphylla* I have noticed in the sandy excavations in Shrawley Wood. Among the rarer Lichens, *Lecidea uliginosa* and *L. icmadophila* have occurred to

\* The "White Mullein" (*V. Lychnitis*) is so plentiful in some seasons, that Mr. W. Mathews and myself once observed more than two hundred specimens scattered about a field on the banks of the Stour, at Cornhill, near Cookley, and being in full flower at the time, they made a spectacle worth the trouble of a long ramble to behold. *V. virgatum* too, though generally growing solitary, yet springs up annually on the sandy soil it loves.

me in the forest paths of Eymoor Wood. *Beomyces rufus* is pretty abundant about Hartlebury Common.

The southern part of the Severn Valley has in low meadows many relics of that vegetation which must have prevailed at an earlier period when the tidal waters of the river made persistent salt marshes, not yet altogether drained.

This is evident in the quantity of *Enanthe pimpinelloides* yet flourishing; while Longdon Marsh produces *Enanthe Lachenalii* and *Æ. silaifolia*, *Rumex maritimus*, and *Scirpus maritimus*. The tidal influence having ceased, but the level country still remaining undrained, and fresh water accumulating, such plants as *Ranunculus hirsutus*, *Hippuris vulgaris*, *Lathyris palustris*, *Utricularia vulgaris*, *Hottonia palustris*, *Ononis pratensis*, and *Hydrocharis morsus-ranae*, are found at present, though with the probability of becoming rarer, if drainage is undertaken on an extended scale. *Bupleurum tenuissimum* has occurred locally near Worcester, and *Smyrniolobos olusatrum* is only found in the southern part of the county. *Apium graveolens* is also a plant of the marshy district. *Iris fetidissima* though fond of hilly spots is most plentiful in the southern part of the Severn Valley, and there only has *Gastroidium lendigerum* been observed. As an instance of a completely localized plant, the *Isatis tinctoria* deserves notice, growing only on the red marl cliff at the Mithe, on the banks of the Severn, but very abundant there.\* It may therefore be concluded, that on the whole, soil and circumstances of exposure, drainage, or the want of it, influence the appearance and continuance of plants in the Worcestershire portion of the Vale of Severn.

Of course in the Severn Valley the entire drainage of the country is by its main artery the Severn, but proceeding from

\* Mr. Watson in his "Cybele" (Vol. i. p. 117), says that the *Isatis* "can scarcely be said to have acquired so permanent a possession of its localities as would justify its reference to the category of denizens." He must have overlooked my list sent for his New Botanist's Guide in 1835, where it is mentioned as *constant* to the above locality. I have known it there myself for forty years.



Bewdley to the south several considerable tributaries swell its waters, besides numerous brooks that need not be particularised. First the Stour, after rising in the woods about Halesowen, and watering the sandstone country from Stourbridge to Kidderminster, falls into the Severn at Stourport. Four miles above Worcester, the Salwarp that rises in Bromsgrove Lickey and passes through Droitwich, meets the Severn at Hawford; and two miles below Worcester, the Teme brings its tribute of waters draining the north-west of the county. In the extreme south the Warwickshire Avon enters Worcestershire on its eastern side, at Prior's Cleeve, and after watering the country with its "soft-flowing" stream from thence to Evesham and Pershore, swells the widening "Cambrian queen" as Drayton calls the Severn, at Tewkesbury. So that in fact, finally the whole drainage of Worcestershire eventually reaches the Severn, except the extreme north-east water-shed, which from the Lickey carries a scanty amount of tribute by Birmingham, or rather its lower part called Digbeth, to the Trent.

## II.

## THE MALVERN HILLS AND VALLEY OF THE TEME.

The Worcestershire plain of red marl is bounded westward at about the distance of six to eight miles from the Severn by the sienitic chain of the Malvern hills, stretching in an undulating series of summits and depressions for more than nine miles from Bromsberrow, Gloucestershire, on the south, to Great Malvern northwards. At Cowleigh, two miles north of Great Malvern, the sienite comes in contact with the Silurian strata, and hence a series of wooded eminences, partly Caradoc sandstone and partly Wenlock limestone, trend to the north-east as far as Knightsford Bridge, on the river Teme, which here breaks through a disruption or fault of the strata at the Permian conglomerate of Rosebury Rock. On the opposite side of the river, the Silurian again shows in the Caradoc of Ankerdine Hill, and after an interruption from the round Conglomerate, or perhaps igneous mass of the Berrow, continues its course to the Ridge Hill, and the Permian mass of Woodbury, ending in the long tail of Abberley that curls round towards the Severn a few miles from Stourport.

This may be considered the hill country of Worcestershire, and the calcareous nature of much of its soil renders it a fit depository for those plants that revel in limestone districts.

The height of all these eminences is, however, inconsiderable, the Worcestershire Beacon at Great Malvern being only 1,444 feet high,\* and the Abberley Hills not exceeding 900 feet in altitude. Most of the other ridges are still lower. No alpine or sub-alpine plants can therefore be expected on the Malvern Hills, for even the Bilberry (*Vaccinium Myrtillus*) grows but sparsely, and species of *Eriophorus* are quite uncommon.

\* As given in the Ordnance Survey. The North Hill, according to the Geological Survey of 1842, is 1,366 feet in altitude, and the point of the hill above Malvern Wells 1,224 feet. Professor Phillips on the same authority gives 1,162 feet as the height of the Herefordshire Beacon. But a barometrical observation some years since gave an altitude of 1,370 feet.

The vegetation of the Malvern division may be conveniently sub-divided into two portions; the flat marshy country at the immediate base of the Malvern chain, and the hills themselves.

#### I. MALVERN CHACE.

At the eastern foot of the Malvern Hills a large common or series of commons still to a great extent unenclosed, present themselves, the whole of which formerly bore the name of "*The Chace*," which seems to have been continued to the middle of the last century. An old song on Malvern, which must have been written before the Chace was disafforested in 1631, thus mentions the deer there:—

"A chase for royal deer  
Round doth beset thee;  
Too many, too I fear  
For aught they get thee;  
Yet though they eat away  
Thy corn, thy grass, thy hay,  
Do not forget, I say,  
To praise the Lord."

But now cut up and cultivated to a considerable extent, the unenclosed portions of the Chace bear the names of the Link, Barnard's Green, Welland\* and Castlemorton Commons, &c. On these commons a number of plashy spots and little pools occur here and there, giving a peculiar aspect to the scene, nourishing various aquatic plants; and small rivulets take sinuous turns along the green lawns in their course to the Severn. In wet weather the water stagnates in many places, and formerly there were some bogs, mentioned by Mr. Ballard, surgeon, of Hanley Castle, (in Withering's Botany,) where *Ranunculus lingua* grew, but these from drainage and cultivation have now disappeared. However, much waste ground still remains, and its wet character enables it to maintain plants that are uncommon, or not occurring in other districts. Such characteristic plants are—

\* Under the General Enclosure Act, Welland Common has been portioned off since 1851, and is now quite enclosed and cut up, so that it can be no longer traversed with facility, and I fear some of its plants are destroyed.

*Montia fontana*  
*Peplis portula*  
*Polygonum minus*  
*Limosella aquatica*  
*Myriophyllum alterniflorum*  
*Heliosciadium inundatum*  
*Bupleurum tenuissimum*  
*Oenanthe Lachenalii*  
 ——— *peucedanifolia*, Sm.  
*Mentha piperita*  
 ——— *pulegium*

*Epilobium virgatum* and *roseum*  
*Pulicaria vulgaris*  
*Triglochin palustre*  
*Lemna gibba*  
*Blysmus compressus*  
*Eleocharis acicularis*  
*Eleocharis multicaulis*  
*Scirpus setaceus*  
*Isolepis fluitans*  
*Zannichellia palustris*  
*Chara flexilis* and *vulgaris*

## II. PLANTS OF THE SYENITE AND LIMESTONE.

The Phanerogamous plants that grow upon the Malvern rocks themselves, are very few in number, and one species only seems at all peculiar. This is a little dwarf *Sedum* with red oblong fleshy leaves, that has hitherto been called *Sedum album*, but its aspect is somewhat different to that of the garden *S. album*, and I feel doubtful if it be really the same.\* That it is truly wild on the rocks of the North Hill, Great Malvern, is indisputable; it only occurs on very precipitous rocks midway up the hill, at about 700 or 800 feet of elevation, does not reach to the summit, and is not seen anywhere on walls at the base of the hills, or near the gardens of the village. It remains very dwarf and red upon the rocks, and very rarely indeed flowers. Twice I have found flowering specimens in the course of twenty years. The only other *Sedums* on the Malverns are *S. acre* and *Telephium*, for though *S. reflexum* grows upon Little Malvern Church, it is nowhere seen upon the rocks of the hills even naturalized. *Potentilla verna* grows on the syenite, and as far as I know not any where else in the county. The other plants that give a character to the Malvern Hills from their abundance are *Geranium lucidum*, *Alsine rubra*, *Cardamine impatiens*, *Manchia erecta*, *Cotyledon umbilicus*, *Corydalis claviculata*, and *Digitalis purpurea*. In the spring *Myosotis versicolor* is rather plentiful, and occasionally *Gnaphalium sylvaticum* is apparent; while the

\* Mr. Borrer has stated this to be *Sedum teretifolium* of Haworth, but whether that is more than a var. of *S. album* I am unable to say. Mr. Babington mentions *S. micranthum* of De Candolle, with leaves "on both sides obtuse," as a var. of *S. album*. This I have not seen. Even taken from its native rocks the Malvern *Sedum* refuses to flower.

little *Filago minima* and *Hypericum humifusum* are common enough, as well as *Ornithopus perpusillus*. About June the declivities of the hills assume a beautiful light green tint from numerous fronds of the common Brake (*Pteris aquilina*), and as these in autumn are burnt up into a rich brown or sienna tint, they are finely relieved by the abundant golden flowers of *Ulex Gallii* and *U. nanus*,\* that long continue to gild the scene. Though there is much plashy ground, yet very few real bogs occur on the hills, and these few contain nothing rarer than *Pinguicula vulgaris*, *Anagallis tenella*, *Drosera rotundifolia*, *Eriophorum latifolium*, and *Blysmus compressus*. *Hypochaeris glabra* though growing but small, occupies the grassy ledges about the base of the southern rocks of the North Hill.

The calcareous strata of the Silurian rocks, being mostly well wooded, with abandoned quarries dispersed about, offers some good habitats for plants, and here accordingly are found many species, that if not entirely confined to the limestone, are yet of less frequent occurrence or not so luxuriant away from its confines. The following are all found on the hills or in the woods reaching from Bromsberrow to Cowleigh Park near Great Malvern, and thence northward to Abberley. To be precise it must be remarked that although the general boundary between Worcestershire and Herefordshire passes along the crest of the Malvern hills, the Worcestershire parish of Mathon crosses over to the Herefordshire side, dove-tailing with Colwall and Cradley, while the latter in its turn interlaces with Malvern and Suckley. Although in some cases it may be dubious as to which county a plant may be located in, yet I believe none I here record are confined to Herefordshire only, most of them extending over a considerable tract of ground in both counties.

\* *Ulex Europaeus* only appears in the plain at the base of the Malvern ridges; it is abundant on the red marl eminences called the Old Hills, two miles south of Powick. The typical trailing *Ulex nanus* is not common on the Malvern Hills, the Gorse there consisting almost entirely of the larger variety, *U. major* of Babington. This last being then not well understood, I described it as *U. nanus* in the 1st. edit. of my Botany of Malvern, while *nanus* itself I called *U. minor*.

A few local plants may be mentioned, as occupying Silurian soil about the bases of the limestone hills, though without any predilection for such a location except as regards moisture. One of these is the Snowdrop (*Galanthus nivalis*), known for a very long period as located in the glen at the north-western base of the Herefordshire Beacon. My friend Dr. Addison, formerly of Great Malvern, observed it also so plentifully near the Wintal Farm, Cradley, as to be deemed "certainly wild" by him there. In March and April meadows of virgin turf on the confines of Mathon and Cradley abound with the Daffodil (*Narcissus Pseudonarcissus*), giving a brilliant floral show to the leafless scene. The Daffodil is equally plentiful in meadows, at the southern part of the Malvern chain.

The Daffodil is so numerous in the meadows about the Malvern Hills, that it may well be considered an aboriginal plant, but I should scarcely say so much of the Snowdrop, long as it may have been located at the base of the Herefordshire Beacon. Still less should I be disposed to consider either *Ornithogalum nutans* and *umbellatum*, or *Gagea lutea* as indigenous, though these have all been found "apparently wild" in the Malvern district since my "Botany of the Malvern Hills" was published in 1843. The two former plants are located at Bromsberrow, and I received specimens of *O. nutans* in flower, through the kindness of the Rev. Reginald Hill. The *Gagea lutea* was found in 1855 by our president, the Rev. Dr. Cradock, on the bank of a brook at the bottom of Purlieu Lane; but how long it had been there is uncertain. Soon after the Rev. F. Dyson gathered it at the same spot.

#### CHARACTERISTIC PLANTS OF THE SILURIAN EMINENCES.

<i>Clematis vitalba</i> , plentiful.	<i>Vicia Bithynica</i> , local.
<i>Aquilegia vulgaris</i> , not uncommon.	<i>Onobrychis sativa</i> .
<i>Viola hirta</i> , widely scattered.	<i>Rosa micrantha</i> .
<i>V. pumila</i> , among the turf and moss.	— <i>tomentosa</i> and <i>villosa</i> .
<i>Hypericum montanum</i> .	<i>Pimpinella magna</i> .
— <i>dubium</i> .	<i>Viburnum lantana</i> .
<i>Anthyllis vulneraria</i> .	<i>Galium tricornue</i> .
<i>Astragalus glycyphyllos</i> .	— <i>erectum</i> , very rare.
<i>Vicia sylvatica</i> , profuse.	<i>Inula Conyza</i> , abundant.

*Carduus eriophorus.*  
*Helminthia echinoides.*  
*Picris hieracioides.*  
*Dipsacus pilosus.*  
*Chlora perfoliata.*  
*Vinca minor.*  
*Gentiana Amarella.*  
*Lathraea squamaria.*  
*Linaria minor.*  
*Veronica montana.*  
*Anagallis cœrulea.*  
*Juniperus communis.*

*Orchis ustulata, rare.*  
*O. pyramidalis, plentiful.*  
*Gymnadenia conopsea.*  
*Habenaria bifolia, rare.*  
*Ophrys apifera.*  
*Neottia nidus-avis.*  
*Epipactis latifolia.*  
 ——— *purpurata, very rare.*  
*Luzula Forsteri.*  
*Bromus erectus.*  
*Hordeum sylvaticum.*  
*Avena pratensis.\**

A few other plants that are peculiar to, or very local in the Malvern district, require to be particularly adverted to. One of these is the little *Centunculus minimus*, which I found some years since in a gravelly spot at the western base of the hills near Brand Lodge, and hitherto it has occurred no where else in the district, and unless on Moseley Common near Birmingham, not in the county.† The Prickly Lettuce (*Lactuca Scariola*), is almost as much restricted, having been only found on the marly eminence of Longdon Hill End. So also *Orobanche elatior* was once found in a clover field at Great Malvern, by Miss Moseley, and I have seen it in that lady's valuable Herbarium, but I am not aware of its having occurred elsewhere in Worcestershire. *Erodium maritimum* used to grow at the eastern base of the North Hill, and may still be found on banks about Barnard's Green. *Lepidium Smithii* is by no means a common plant. *Hypericum montanum* is also an uncommon Malvern species, being confined to the woods of the Holly Bush Hill. *Rumex pratensis* has occurred in meadows near Longdon, and *R. pulcher* occasionally. *Lathyrus sylvestris* appears only in the southern part of the district on the Keuper marl at Pendock Portway and Gadbury Banks; and the pretty little *Orobis tenuifolius* on

\* The exact stations for all these may be seen in the "Botany of the Malvern Hills."

† Among a lot of Malvern plants I once sent named to the London Botanical Society, by some mischance among small specimens, a dwarf *Rhamnus catharticus* took the place of *Centunculus*, which Mr. H. C. Watson apprised me of; but that it was merely a misplace was shown by specimens of *Centunculus* gathered afterwards at the precise spot by my friend Westcombe.

Seats Common, Malvern Wells. *Polygonum minus* and *Myriophyllum alterniflorum* are both rare inhabitants of the wet spots about Barnard's Green and Welland Common, as is also the minute *Eliocharis acicularis*. The exceedingly small *Helosciadium repens*, as seen in springy spots on the hills, fully preserves its character as the least British umbelliferous plant. *Spergula nodosa* occurs, though but sparingly on wet spots, where water oozes on the sides of the hills. I ought, also, to mention the curious *Tormentilla reptans*, which has elicited various opinions from botanists. Its prostrate habit is peculiar, extending far along the ground, and its long trailing stem, often compound, *never rooting*, as in *Potentilla reptans*, and its small ternate leaves hairy beneath, give it a very different appearance to either the latter plant or *Tormentilla officinalis*. As an instance of a plant reduced to very small dimensions from its position, or paucity of soil, I may adduce *Hieracium pilosella*, var. *brevicaulis* of my Malvern Botany, which deserves as much notice as the long-stalked var. *Peleterianum*. In the Herb. of the Nat. Hist. Soc. at Worcester is a *Scrophularia*, gathered near Alfrick Chapel by Mr. G. Reece, which appears to me to be *S. Ehrharti*. *Juncus obtusiflorus* grows in the Welland Marshes, but is rare. A curious *Carex* with long bracts also merits attention, which was gathered by me on Seats Common, Malvern Wells, some years ago. This has been supposed to be *Carex argyroglochis*, (Phyto. ii. 751), while in a previous volume of the Phytologist it was named *Carex Malvernensis*, as something altogether new. Mr. S. Gibson, of Hebden Bridge, Yorkshire, who paid much attention to the Carices, and to whom I sent the plant, called it *C. ovalis*, var. *bracteata*.

Although the Malvern Hills are almost entirely bare, with the exception of the Holly-bush hill, whose name proclaims the tree it plentifully nourishes, yet the Silurian heights westward and northward of them, are thickly covered with wood in many instances to their very summits, thus giving a picture of romantic beauty to the scenery on the western side of Worcester-



shire, which is absent on the eastern, where the marl and sandstone extends in dull and scarcely undulating continuity.

These woods though principally consisting of Oak and Hazel, with occasional clumps of Mountain Ash (*Pyrus aucuparia*), and Wild Service (*Pyrus torminalis*), are remarkable for producing a considerable quantity of Limes, both *Tilia parvifolia* and *Europæa*, which, however, being cut down for coppice-wood, rarely or never flower, though old trees that do so are scattered about in the hedges that bound the woods at their base. The Limes appear in coppices with other bushes, and have every appearance of being unquestionably indigenous; in lone spots they occupy the ground, to the exclusion of other trees, and at Callow's Leap, Alfrick, they shadow the rapid brook there, and have their roots washed bare by the running water, as is so frequently the case with the Alder. Many old Lime trees occur so hollow and wenny as to render it probable they must have existed at the spot for three or four hundred years. I have traced the limes in these woods from Castle Morton near Little Malvern on to Abberley Hill northwards, a distance of above twenty miles.

Besides the Lime, the Wild Cherry (*Prunus avium*), \* is very common in these hilly woods, which are diversified with scraggy individuals of the solemn Yew (*Taxus baccata*), as well as numerous young seedlings. Witch Hazels (*Ulmus montana*) are very abundant upon the uplands around, especially in old hedges, and from periodical lopping, the heads of many of them assume singularly monstrous shapes. The Birch (*Betula alba*) occurs more or less plentiful, and in some spots predominates, as about the Berrow Hill, Martley. The Aspen (*Populus tremula*) appears in almost every wood, and the Black Poplar (*P. nigra*), accompanies the wayward courses of several brooks, on whose banks old rifted pollards are of frequent occurrence. The White Poplar (*P. alba et canescens*), occasionally presents itself on the margins

\* The Cherry has certainly much increased in the woods of late years, so that Mr. Watson's suggestion as to the dissemination of the cherry by birds, is probably correct.

of wet commons, and in hilly spots by brawling rivulets. Between the two varieties I am unable to see any valid distinction. The Maple (*Acer campestre*), is a very common tree.

The Beech, Chestnut, Whitebeam (*Pyrus Aria*), and Hornbeam (*Carpinus Betulus*), are *entirely absent as native trees* from the Malvern district, and indeed from Worcestershire also, except *Pyrus Aria*.

Within this line of belted hills are many interesting localities inviting to the investigation of the botanist, and I need not dwell upon the Malvern hills themselves, as I have illustrated their botany in a separate work. Yet I would mention Welland Common, Barnard's Green, "the Gullet" between the Holly Bush and Warren Hills, and Cowleigh Park, near Great Malvern, as places well deserving a minute exploration. The thickets about the bases of the Malvern hills and the Silurian woods, nourish many remarkable and local Brambles, which at a time when this tribe has received so much attention from Mr. Babington, the Rev. W. A. Leighton, Dr. Bell Salter, and my acute and amiable friend the Rev. Andrew Bloxam, ought not to be neglected, and some indeed are too characteristic to pass unnoticed. Of the rarer ones, *Rubus Bellardi* grows luxuriantly on the Rough Hill beyond Cowleigh, and in the woods of the Old Storridge, Alfrick; while in Cowleigh Park, *R. fuscus*, *R. pallidus*, *R. rudis*, *R. macrophyllus*, *R. amplificatus*,\* and *R. Lejeunii*, are to be found. *R. Lindleianus* (*nitidus*, Bab. and Bell Salter), is by no means uncommon, but *R. affinis* is rare, and only occurs near Malvern Wells. *R. plicatus*, known by its barren stems rising in air eight or ten feet before arching, occurs at the western base of the hills in two or three wet places, but is

\* An enormously developed bush of *Rubus Schlectendalii*, W. and N. (a var. as I consider of *R. amplificatus*), has grown for fourteen years to my observation in a low part of Cowleigh Park, its barren stems excessively thick, sending forth branching shoots each year, but these *not rooting*. The panicle *excessively dilated*, though occasionally narrow and not branched at all.

rare. The Raspberry (*R. Idæus*), is common in many woods, and in the thickets of Witley Park flourishes profusely.\*

The Roses also abound in this division, *R. villosa* and *R. tomentosa* being prevalent in and about the woods of the Silurian hills. The fragrant-leaved Roses as *R. rubiginosa*, *micrantha*, and *inodora* are not uncommon; and *R. sepium* occurs at Little Malvern. *R. Sabini*, var. *Doniana*, and *R. spinosissima*, are very rare. *R. arvensis* is perhaps more abundant than *R. canina*. *R. systyla* occurs locally, as in a coppice at Malvern Wells, and near Powick. A rose with remarkable glaucous leaves ("*R. glaucophylla*"), allied to *R. canina*, but with *densely setose* fruit and peduncles, forms large bushes bordering on the road-side near the Cradley turnpike, and deserves attention, being a very singular form. It may perhaps be *R. hispida* of Desv. Journ. Bot. and has a very different appearance to *R. canina*.

The other flowering plants that principally contribute to give a feature to the woods of the Malvern district, are the following:—

<i>Chrysosplenium alternifolium</i>	<i>Myosotis sylvatica</i>
<i>Campanula trachelium</i>	<i>Melampyrum pratense</i>
<i>Camp. latifolia</i>	<i>Pedicularis sylvatica</i>
<i>Oxalis acetosella</i> and a var. with purple flowers	<i>Galeobdolon luteum</i>
<i>Sarothamnus scoparius</i>	<i>Stachys Betonica</i>
<i>Asperula odorata</i>	<i>Ajuga reptans</i>
<i>Sanicula Europa</i>	<i>Lysimachia nemorum</i>
<i>Anemone nemorosa</i>	<i>Polygonum Bistorta</i>
<i>Polygala vulgaris</i>	<i>Daphne laureola</i>
<i>Hypericum perforatum</i>	<i>Paris quadrifolia</i>
— <i>dubium</i>	<i>Orchis mascula</i>
<i>Orobus tuberosus</i>	<i>Habenaria Chlorantha</i>
<i>Fragaria vesca</i>	<i>Neottia Nidus-avis</i>
<i>Galium cruciatum</i>	<i>Agraphis nutans</i>
	<i>Luzula pilosa</i>

The plants most restricted to this division of the county appear to be the little turgid var. of *Sedum album*, and *Potentilla verna* on the syenitic hills themselves; *Elymus Europæus* in the Silurian limestone woods; and *Polygonum minus*, *Pulicaria*

\* The Raspberry increases in our hilly woods, springing up after a fall of coppice, where none was known before. The same thing occurs elsewhere, for Mr. John Evans informed me that at Longville Castle, Salop, Raspberry bushes had appeared in great quantities on the site of an oak wood that had stood for centuries, after it was felled.

*vulgaris*, *Limosella aquatica*, *Tormentilla reptans*, *Epilobium roseum* and *virgatum*, *Myriophyllum alterniflorum*, and *Juncus obtusiflorus* in the flat marshy country at the eastern bases of the hills.

A few are particularly confined to one locality only, as *Galium erectum* at Alfrick; the minute *Centunculus minimus* near Brand Lodge; *Scrophularia Ehrharti*? near Alfrick Chapel (according to Herb. Nat. Hist. Soc. where is a specimen); and *Lactuca Scariola*, which I have gathered at Longdon Hill End.

*Orobanche elatior* is in Miss Moseley's Herb. as gathered in a clover-field at Great Malvern, under adventitious circumstances; and Mr. Borrer is recorded in Hooker and Arnott's British Flora, to have gathered *Genista pilosa* at Little Malvern. I suspect some mistake of substitution in the latter case, no one else having ever observed it.

As a matter of botanical curiosity it may be worth mentioning, that the Mistletoe (*Viscum album*), grows on an oak near the Ridgeway in Eastnor Park, below the western base of the Herefordshire Beacon. There are several bushes of Mistletoe on branches near the top of the tree, and I have known it there for above twenty years.

In the recesses of the Silurian eminences many favourable spots for botanical rambles might be mentioned, and interesting in themselves for the pleasing scenery they present to view, as Callow's Leap, near Bridges Stone Mill, Alfrick, where Leigh Brook after piercing the Silurian strata in many gurgling meanders, enters upon the red sandstone near a remarkable cliff of trappoid conglomerate. From hence to Rosebury Rock, Knightwick, where a trappoid outburst covered with wood most romantically overhangs the Teme, a succession of pleasing scenery presents itself, and the opposite eminence of Ankerdine Hill, doubtless so called from some anchoret who once dwelt there, is not undeserving of examination. From the summit of the Berrow Hill, a singular rounded mass of trappoid

conglomerate, the windings of the chrystal-shining Teme accompanied by its belt of pollard willows offers a remarkable object in the landscape, which here opens beyond the old red sandstone heights of Herefordshire to the blue misty Cambrian mountains.

The *Cryptogamous Vegetation* of the Malvern division is very interesting, but I must refer to my "Botany of the Malvern Hills," for its fuller elucidation. I shall therefore only mention a few of the more remarkable and interesting products it presents to view.

It is needless on this occasion to enter into very minute particulars on the plants of the Malvern Hills and the Valley of the Teme, as they are detailed at length in my "BOTANY OF THE MALVERN HILLS;"\* and the only phanerogamous additions since made to my list are those of *Ornithogalum nutans* from Bromsberrow, *Gagea lutea* discovered by the Rev. Dr. Cradock, *Poterium muricatum* found near the Wych in 1853, by my friend the Rev. J. H. Thompson, and *Raphanus Raphanistrum* omitted by an oversight. I may remark, however, that the Malvern district is the only one in our county where the *Cryptogamic* vegetation has been at all worked out; indeed almost the only remarkable feature in the Flora of the Malvern rocks is, the *abundance and prevalence of the lower tribes of plants*, as thus enumerated.

	Species.
Ferns and Equisetacæ .....	24
Mosses .....	148
Jungermanniæ .....	80
Other Hepaticæ, Characæ, &c. ....	28
Lichens .....	254
Fungi .....	428
	<hr/> 912

The number of Phanerogamic plants in the Malvern district amounting to 807, it thus appears that these are outnumbered by the Cryptogamous species, which will probably always be the

\* The "Botany and Geology of the Malvern Hills," &c. By Edwin Lees, F. L. S. 2nd. Edit. Lamb, Malvern, and Bogue, London.

case in temperate latitudes, where there is any mountain or range of hills exceeding 1000 feet in altitude.

Scarcely any of the rarer Ferns occur in this division of Worcestershire, and the *Cistopteris* are entirely absent. *Ceterach officinarum* did occur on a stone wall by the road side at Malvern, which has, however, been recently demolished, and it requires re-discovery if possible, on some "humbler shed." Mr. Newman's habitat on the Abbey Church now alone remains, though even that at present is unattainable. *Polypodium Dryopteris* occurs rather plentiful among a wilderness of stones in a ravine between the North and End Hills, and also on the western declivity of the Worcestershire Beacon; but the true *P. calcareum* has not been hitherto found. *Lastræa Oreopteris* is an inhabitant of boggy spots in several localities at the bases of the Malvern Hills, and *Polystichum lobatum* and *angulare* are of general occurrence in shady lanes and stony ravines, many primitive ones of which yet remain serving both as parish roads and water-courses. *Lastræa dilatata et spinulosa*, (or *L. multiflora* and *spinosa*, Newman,) are not uncommon in woods and alder-copses. *Blechnum boreale* is of frequent occurrence.

The common Polypody (*P. vulgare*), fringes the Malvern rocks frequently with a stubby beard, and the "Lady Fern" (*Athyrium Filix-femina*,) as commonly called, is abundant in wet shady places at the bases of the hills, and even to some distance up their sides. The general form it puts on is that named *Athyrium rhaeticum*, Roth, or *Athyrium Filix-femina*, var. *converum*, Newman; and its rachis is often very thick and purplish-red, the pinnules totally brown beneath with the abundant confluent sori. This perhaps is the result of exposure, as the more elegant drooping variety appears by shaded rills, as in the wood at Little Malvern.

The little Mountain Parsley Fern (*Allosorus crispus*), in general so plentiful upon the Welch mountains, I have never found but in one spot, and that is upon the eastern or Worcestershire side of the Herefordshire Beacon, on a crumbling rock about half

way up a protuberance of the hill opposite to the White Farm. In 1851 but one plant remained, and I fear its obliteration from the locality. *Ophioglossum vulgatum* grows on the turf near Purliu Lane, Mathon, and at the northern base of the Holly-bush Hill; but the *Lycopodia* are entirely absent throughout the Malvern chain, as well as the ranges of Silurian hills.

I have enumerated 148 species of Mosses as growing on and about the Malvern hills, of which the most interesting and local are *Gymnostomum pyriforme*, *Bryum roseum*,\* *B. rostratum* and *ventriosum*, *Bartramia ithyphilla et fontana*, *Neckera pumila*, *Anomodon curtispiculum*, and *Daltonia heteromalla*, the latter of which grows on the boles of old Holly-trees on Holly-bush Hill. *Encalypta streptocarpa*, which is rare, is found in crevices of the Silurian limestone, and *Hypnum riparium* and *ruscifolium* are seen in many of the rivulets flowing out of the calcareous strata. The sides of the broken ground of the hills is often adorned with *Polytrichum piliferum* and *juniperinum*. In the shade of the thick woods flourish *Hypnum loreum*, *splendens*, and *proliferum*, as well as the little *Bryum androgynum*. The curious and local *Zygodon Mougeotii* of Bruch and Schimper, grows under dripping rocks on the northern side of the Worcestershire Beacon in large cushion-like tufts, but is always barren there. Growing parasitically among this moss I have found *Jungermannia connivens* for several successive years, and most beautifully in fruit. *Didymodon flexicaulis* occurs also, though rarely, in damp parts of abandoned lime quarries towards Mathon. The Squirrel-tail moss (*Leucodon sciuroides*), occupies trunks of old ash trees near Malvern Wells. I must add to my list *Tortula tortuosa*, *Orthotrichum Lyellii*, and *Bryum cuspidatum* and *turbinatum*.

*Jungermannia ciliaris* is particularly abundant and beautiful on the Malvern hills, as is also *J. Tamarisci*, *furcata*, and *ventricosa*. The very elegant *J. Tomentella* occurs at the Gullet,

\* *B. roseum* I have gathered in fruit in the little Beech-wood near the Wells House, but it is very rare in this state.

and on High Grove Hill, and *J. polyanthos* in the bog ; while *J. pinguis*, *epiphylla*, and *multifida*, are plentiful in moist spots. *J. ventricosa* with its brilliant golden gemmæ is plentiful and beautifully conspicuous in the early part of the year. Since the publication of the Malvern Botany, I have gathered *J. spinulosa* at Colwall.

Among the *Hepaticæ*, indigenous to the Malvern ridges, may be mentioned the curious *Targiona hypophylla*, *Anthoceros punctatus*, *Marchantia polymorpha*, *conica*, et *hæmisphærica*.

Lichens are profusely abundant, fettered to the Malvern rocks, and too numerous to particularise ; but the crimson apothecia of *Lecanora coccinea*, glow like rubies in moist weather, and the *Stereocaula*\* appear like silver spangles scattered and clustered in the recesses of the rocks. Almost equally beautiful is *Beomyces rufus* when in fruit, while the higher rocks are coated with *Lecanora glaucoma*, *Parella*, and *tartarea*, *Urceolaria cinerea*, and *gibbosa*, or have a remarkably hoary aspect imparted to them by the silvery tufts of *Isidium coralloides*, or the coralline entanglement of the shining stems of *Sphærophoron compressum*. Some of the higher rocks of the North Hill are quite dingy with the armour-like coating of *Parmelia stygia*, relieved occasionally with the beautiful golden lustre of *Borreria flavicans*. *Parmelia saxatilis*, *physodes*, and *perlata*, are very abundant. On the higher rocks the curled *Cetraria glauca* grows in abundance, the purple *Parmelia omphalodes* is seen, and exposed masses of the ridge are frequently curiously dotted with the green adnate thalli of *Lecideia geographica*.

Several lofty rocks of the Worcestershire Beacon are blackened over with quantities of the sooty *Umbilicaria pustulata*, and one of the eastern rocks in particular is bearded with Rock Hair (*Alectoria jubata*). The Endocarpon family is rare, for I have only found *E. Hedwigii* at Chances Pitch, and *E. miniatum*, var. *complicatum*, on the rocks of the North Hill. The beautiful

\* *S. botryosum* appears to be the prevalent Malvern species. *Stereocaulon nanum* grows elegantly minute on Rosebury Rock, Knightwick.



cortical *Thelotrema lepadinum* is only found on the old holly trees of Holly Bush Hill, and those of Brock Hill. The *Sticta* family is not very numerous, but *S. sorobiculata* and *fuliginosa* may be occasionally seen on the rocks above Great Malvern; *S. pulmonaria* more rarely on trees, and occurred at Powick this year (1856), on a very old Pear-tree near Bush Hill. *Nephroma resupinata* is confined to a single low ledge of rocks in an eastern ravine of the Worcestershire Beacon, where it has been stationed in all probability a great number of years. *Collemas* are rather numerous on the Malvern hills, and often coating the mosses with a black plaister. *C. flaccidum*, *crispum*, *ceranoides*, *sinuatum*, *lacerum*, and *tenuissimum*, though but seldom fruiting, are the more remarkable. *Cornicularia aculeata* is conspicuous on the higher part of the hills, with *Cladonia rangiferina* and *uncialis*, and numerous *Scyphophori*. *S. gracilis* and *S. cocciferus*, as remarked by Sir J. E. Smith, seem at any rate distinct from the rest of this intricately protean family.

Since the second edition of the "Botany of the Malvern Hills" was published, I have discovered the beautiful *Calicium tigillare* growing upon old oaks in Cowleigh Park.

The Fungi found on the turf of the Malvern Hills and in the woods about their bases, are too numerous to dilate upon in this essay. I can only select a few as rare or characteristic, and it must be remarked that this is a vegetation that living on the decay of other life, must be ever on the increase. Thus as Larches have been recently planted on the eastern slopes of the hills near Malvern Wells, and at Little Malvern, Fungi will in time appear that were unknown at the locality previously to the planting of the larches. So also species now growing in beech plantations were not there before the beeches came. The cryptogamic botanist may carry the subject still farther backward, and thus the Fungi may be considered the latest of Nature's vegetable creations.

Among Agarics, the St. George's Mushroom (*A. Georgii*, *With.*) is particularly abundant on the declivities in autumn, and

other common species are *A. aruginosus*, *granulosus*, *pratensis*, *conicus*, *coccineus*, *pyxidatus*, *muralis*, and *geophyllus*. The brilliant scarlet *A. muscarius* is not uncommon, as well as *A. ruber* and *A. purus*; but perhaps the rarest Agaric of the district is *A. tigrinus*, which I collected a few years since from an old willow tree near Powick. Many coloured *Clavariæ* occur on the hills in the decline of summer, and the pretty *Sphaeria militaris* may not unfrequently be met with. Specimens of *Cantharellus aurantiacus* I have gathered on the very summit of the Worcestershire Beacon. Rarer species found only at intervals, are *Helvella crispa* and *elastica*, *Peziza onotica* and *badia*, *Cantharellus cinereus* and *cornucopioides*, *Clavaria pistillaris* and *abietina*, *Leotia inbrica*, *Morchella semilibera*, *Reticularia umbrina*, and *Geaster hygrometricus*.

*Scleroderma vulgaris* occurs pretty abundantly, about Malvern Wells, and *Phallus impudicus* in the beech grove there. The elegant *Nidularia crucibulum* may be sometimes met with on old stems of gorse, as well as various *Thelephoræ*; while the little blood red *Peziza humosa* is very common among dark masses of *Polytricha*. The brown edible *Boletus edulis* is often to be seen in autumn with other less agreeable *Boleti*, and in the woods on the Silurian strata *Hydnum repandum* and the Chantarelle, (*Cantharellus cibarius*), are always to be found at the proper season. Several species of *Arcyria* and *Trichia* are also observable, so that Malvern opens a wide field of investigation to the Cryptogamic botanist.

In moist weather a characteristic feature is presented to the view in the quantities of "Jews' Ears" (*Excidia Auricula-Judæ*), that then hang upon the countless old Elder-trees that cover the eastern declivity of the Herefordshire Beacon.

For a predominance of Cryptogamic Vegetation, a superabundance of moisture in the atmosphere would seem to be required, and the prevalence of western winds at Malvern is favourable to that condition. When my friend Dr. Addison

resided at Malvern, he made a careful series of meteorological observations, from which he concluded that the duration of vapoury moist winds through the year greatly exceeded that of dry ones. I am unable to give the exact fall of rain at Malvern itself, as I know not of any careful meteorological observer now residing there, but I believe that the fall about the base of the hills will not be found to differ materially with that of the upper part of the valley of the Teme, the vegetation of which I have united with that of Malvern. Now Mr. T. H. Davis, of Orleton, on the western side of the Teme Valley near Stanford, has for many years past paid attention to the subject, and from his Report in the Worcester Herald, it appears that in 1855, the amount in inches of the fall of rain at Orleton, was 28,380, and the average of twenty years ending 1850, was 28,276. If this is compared with the statement of the late John Williams, Esq., of Pitmaston, near Worcester, who gives 27 inches as "the average fall of rain about Worcester,"\* then the greater fall on the higher ground of the Teme valley, and about the Malvern range as well, is evident. According to Dr. Ick's observations at the Philosophical Institution, Birmingham, the average depth of rain that fell there (which being close to the northern boundary of Worcestershire may well serve for the Bromsgrove Lickey District,) for the seven years preceding 1843, was 25,900, so that the western part of Worcestershire much exceeds this amount. The mean annual temperature for the whole year at Malvern, as given by Dr. Addison, is 49.6; that of Birmingham according to Dr. Ick, 48.7.

#### VALLEY OF THE TEME.

The Valley of the Teme must be considered in connection with the Malvern district rather than with the Severn Valley, for although from the mouth of the Teme two miles below Worcester, to Broadwas upwards, about six miles, there is little

\* Midland Medical Reporter, and Hastings' Illustrations of Nat. Hist. In five years of observation at St. John's, Worcester, by the late Dr. Turley,—1846 to 50, the fall of rain in any year did not exceed 24.30.

to give it any peculiarity, yet at Knightsford Bridge with romantic heights on either side, it has a very rapid current, and assumes more of the character of a mountain stream. Hence too up to Tenbury, at the extreme north-west point of Worcestershire, about twelve miles, the course of the river is entirely through the geological formation of the old red sandstone, and some peculiar plants might be expected to occur. At any rate it may be well to make the comparison.

The Teme burrows deeply into the valley through which it flows, having rough irregular banks, and often washes some bare escarpment or rock gloomy with wood, presenting striking scenery for the contemplation of the geologist or lover of the picturesque. At Knightsford Bridge in particular, either the river or some pre-existing marine current has broken through the Silurian ridge at the point where the Permian trappoid conglomerate of Rosebury Rock (having probably an igneous centre), boldly rises to the height of 378 feet,\* with the foaming Teme rushing at its base. On this wooded precipice *Lathræa squamaria* and *Cotyledon umbilicus* associate with various Ferns† and Mosses, and this gloomy shelter is one of the few places in Worcestershire where the Lungwort (*Sticta pulmonaria*) has been found. The Yew-tree here contributes to give a sombre aspect to the broken ground, and there are many old stubs of *Tilia parvifolia*. Several Fungi lovers of luridity, here find a home, as the local *Lycogola vulgaris*, and *Thelephora cærulea* has occurred very fine, with the most vivid ultra-marine tint. Here also I have observed the scorched Sphæria (*S. deusta*), spreading over rotting trunks of trees with its inflated thallus to a wide extent, black as charcoal, as if some fire had been smouldering upon the ground.

There is a feature in the country between Knightsford Bridge and Tenbury that it is important to notice, as a favourable soil

\* Not above the Teme itself, but the sea. *Phillips*.—Geol. Surv.

† I have here gathered some singular multifid vars. of *Scolopendrium vulgare*, 18 inches long.

for orchideous plants is thence derived, and consequently more of that tribe are located about this district than in any other part of Worcestershire. The tributary brooks that flow into the Teme hereabout, all rise in the old red strata, and their waters are so loaded with calcareous particles, that masses of Travertine of some size have been deposited, particularly at Southstone's Rock, near Stanford ; and traces of similar action still going on are observable at the Hoar Stone, near Tedstone, and at the Spout Brook, at Eastham.

When our late President the Rev. Dr. Cradock, now Principal of Brasenose College, Oxford, was rector of Tedstone-de-la-Mere, he conducted my friend Mr. T. Baxter and myself to some of the most interesting botanical localities in the vicinity, and the following Orchids were then gathered by us, or had been noticed by Dr. Cradock in the neighbourhood of Tedstone.

<i>Epipactis latifolia</i>	<i>Orchis viridis</i>
— <i>palustris</i>	<i>Orchis pyramidalis</i>
<i>Spiranthes autumnalis</i>	<i>Gymnadenia conopsea</i>
<i>Neottia nidus-avis</i>	<i>Habenaria bifolia</i>
<i>Orchis ustulata</i>	<i>Ophrys apifera</i>
— <i>Morio</i>	

So many rare *Orchidæ* growing in the same vicinity is rather uncommon (to say nothing of commoner species), and the Marsh Helleborine (*E. palustris*), and the Pyramidal Orchis, were excessively abundant.

I have also observed *Orchis pyramidalis* and *Ophrys apifera* in great plenty on the travertine by the Spout Brook at Eastham, between Stanford and Tenbury ; and at the same place it is stated by Sir J. E. Smith in the "English Flora," that the late Rev. Edward Whitehead who was rector there, gathered the very rare Fly Orchis (*Ophrys muscifera*). I have not heard of any recent find of it there. The Bee Orchis has been gathered also at Abberley, and by Mr. Baxter at the Ridge Hill Quarries, Martley. *Epipactis latifolia* grows besides in the "Devil's Den," near Clifton-on-Teme, and I observed it in 1843 in some quantity growing up under the shade of a large *Abies* in Kyre

Park, near Tenbury, forming nearly a circle round the tree. I once noticed *Orchis viridis* quite numerous in a wet meadow at the northern base of the Round Hill, Abberley, though this mostly grows solitary.

But I have a most remarkable discovery to mention here of an Orchid new to Britain, gathered at Tedstone on the banks of Sapey Brook, in 1854. This brook of legendary fame, rises partly in Upper Sapey parish, Herefordshire, and partly in Clifton-on-Teme, Worcestershire, flows through Clifton and Lower Sapey, both in Worcestershire, then waters the dingles of Tedstone, in Herefordshire, and falls into the Teme at Knightwick, in Worcestershire. I have mentioned this interlacing of the counties, to show that in detailing the characteristic vegetation of the Teme Valley, that it would be mere folly to exclude the notice of the plants of Tedstone because it is an interlapping portion of Herefordshire. The Sapey Brook is a wild shallow stream forming scores of water-breaks among great slabs of sandstone, shrouded in parts with monstrous leaves of the *Tussilago*, or a thick growth of the great Water Horse-tail (*Equisetum Telmateja*); and in one romantic spot where a little cascade pours down a lateral dingle over a mossy rock, and thence by a short course through copsy ground into the brook, the place even by the country people around bears the name of "the Paradise." It was in this very "paradise," that Mrs. Anderton Smith while on a visit to her brother-in-law at Tedstone Rectory, when wandering here in the summer of 1854, accidentally noticed and gathered an unknown leafless orchideous flower. As it could not be made out by any British Flora, it was sent to a friend in Somersetshire, and by him forwarded to Mr. H. C. Watson, who pronounced it to be *Epipogium aphyllum*. This is a little leafless orchid only hitherto found on the Continent in sub-alpine localities, as in the woods of Dauphiny, about the Jura, &c. It was called *Satyrium Epipogium* by Linnæus, and *Limodorum Epipogium* by Swartz. It may be thus described:—Plant bulbose at base, leafless, with

2 or 3 brown scales on the stem, which is 4 or 5 inches high, having 2 or 3 terminal flowers, the uppermost one mostly abortive. Perianth 6-partite, irregular, resupinate, pale yellow; lip erect with raised purple granulations within, and a very short broad spur. Its leafless stem, and the bright yellow and purple tints of its corolla, give it an appearance not to be mistaken, if met with in a flowering state. Mr. Smith, the lady's husband, a few days after met with the plant again, no doubt the same mass of roots, and it was removed to a shady part of the rectory garden, where I understood three flowering stems were developed, one of which was kindly given to me, and I presented it to the Linnæan Society of London. It must be remarked that the trees had been recently cut down at the spot, and light and air admitted; yet the supposition that the *Epipogium* had here lurked unseen by any one for centuries, and only now appeared, seems scarcely admissible. But perhaps hidden beneath the shade of boughs, plants may keep on a barren unflowering life for a very considerable time, and only become instigated to fertility by the increased light and temperature that the felled trees permits them to enjoy. Yet why may not the seeds of rare plants be carried by natural causes to congenial spots, where they may vegetate for a time only?

There are some other rare plants in this secluded part of Worcestershire, that deserve to be noticed. One of these is *Daphne Mezereum*. This has long had the reputation of growing within Stanford Park (Sir T. Winnington's), and in the English Flora of Sir J. E. Smith, (1824), is said to be found also at Eastham, on the authority of the Rev. E. Whitehead, formerly rector of that place. The Rev. Dr. Cradock when residing at Tedstone, took some pains to ascertain that the Mezereon still grew in Stanford Park, and the Rev. E. W. Ingram who saw it in the park, says it appeared to be indigenous there; but the Eastham locality remains to be confirmed. It also grows in the hilly wood behind Little Shelsley Church, for I have seen specimens gathered there by Mrs. Smith of Shelsley Court, in 1854. These were

so dwarf that they had every appearance of being genuine natives, and as the wooded sandstone heights here rise to between 400 and 500 feet above the Teme, the locality in old woods of indigenous trees, is favourable to the supposition, since the *Mezereon* is not a plant given to wander, nor can I imagine any purpose in planting it.

With respect to *Aconitum Napellus*, another Eastham plant, I suppose there is no botanist that will do otherwise than allow an act of naturalization in its favour, and yet I have observed it in a marshy spot among alders at the top of Eastham Hill more than 500 feet in height, where it had as natural an aspect as it could have on the Continent, nor was any house near. But whether at any former period any refuse from a garden had been placed at the spot, I cannot at all tell. The plant also appears on the banks of a stream above Tenbury, that is a tributary of the Teme, and there, certainly, one can hardly believe but what roots of it have floated off from gardens, or the seeds been scattered in a similar way.

The Elecampane (*Inula Helenium*), is also a native of this part of the county, if any where in Worcestershire. Though in the case of so fine a plant and long cultivated in old gardens, it is almost impossible to do otherwise than suspect its true nativity. But it certainly does make a magnificent show close under the end of the old red marl cliff, at Berrington, above Tenbury, where I saw a great quantity a few years since, and the late Mr. T. B. Stretch had a specimen in his Herbarium, from near Stanford. Mr. Newman also mentions in the *Phytologist*, that he saw the plant near Knightsford Bridge.

This extreme north-western portion of the county lies much out of the common path of exploration, and its dark wooded heights and lonely dingles still left in a state of nature, might reasonably be expected to nourish plants not found elsewhere in the county, and one of these is the very local *Actinocarpus Damasonium*, which has been found at a pool side, near Tenbury.



This plant being most attached to the south-eastern counties of England, scepticism might attach to a mere report by a young botanist; but having an authentic specimen, no doubt, whatever, can exist on the subject.\*

The following other species may be enumerated as giving a botanical feature to this district, and some are very rare or not known in any other part of the county.

Ranunculus parviflorus	Vinca minor, plentiful
Helleborus viridus	Pulmonaria officinalis
———— foetidus	Orobanche major
Aquilegia vulgaris	Lathræa squamaria
Hesperis matronalis	Mentha rotundifolia
Cardamine impatiens	———— viridis
Hypericum Androsæmum	———— sativa, var. rubra
———— dubium	Origanum vulgare
Vicia sylvatica	Rumex pratensis
Rubus Guntheri	Polygonum Bistorta
Rosa rubiginosa	Taxus baccata
Geum intermedium	Narcissus biflorus
———— rivale	Carex pulicaris
Saxifraga granulata	———— strigosa
Chrysosplenium alternifolium	———— pendula
Myrrhis odorata	Eriophorum latifolium
Campanula Trachelium	

Some suspicion may perhaps attach to *Myrrhis odorata*, *Pulmonaria officinalis*, *Mentha viridis*, and *Narcissus biflorus*, as being naturalized plants, or only “apparently wild;” but *Hesperis matronalis* among rank herbage by the wild brook side, has every appearance of being a native, and *Myrrhis odorata* has been so long established near Southstone’s Rock, that its nativity would hardly be doubted, were it not that in ancient days the monks of Evesham had a cell and likely a garden too, here. The mints are in spots secluded enough, if that were all that is required.

A few of the rarer ferns have been met with in the Teme Valley, or its lateral glens, as *Blechnum boreale*, *Lastrea*

\* Mr. Watson states the *Actinocarpus Damasonium* to be “Peculiar to the three south-eastern provinces of Channel, Thames, and Ouse, with two alleged and very local exceptions,” namely—Ellesmere, Shropshire, Mr. J. E. Bowman; and Gulval Marsh, by Penzance, Rev. W. T. Bree. Here is another, if Mr. Watson will take my authority. There is perhaps not much wonder that secluded ponds and marshes may long retain local plants in their obscurities, as outpost sentinels from the main position where the species particularly abides.

*Oreopteris*, *Cistopteris fragilis*, *Asplenium viride*, and *Botrychium Lunaria*. The latter was gathered by our Honorary Secretary, Mr. W. Mathews, on the Cockshoot Hill, above Shelsley, when I was in his company.

A curious history attaches to *Asplenium viride*, and its position on Ham Bridge,\* though the botanical interest of the locality is now I fear lost for ever. In 1827, when quite a young botanist, the Herbarium of the late Mr. T. B. Stretch, of Worcester, passed through my hands, and there I observed *Asplenium viride*, with the habitat of "Ham Bridge." Never having heard of this fern growing except in mountainous spots, I took the first opportunity to go there, but found that the bridge had been recently whitewashed, and there was no trace of the plant. I had almost forgotten the circumstance, when on passing the bridge in 1835, to my great surprise the beautiful little fern had re-appeared. It grew not only on the wall next the river, but on the side close to the dusty road, strange as the fact may seem. Here it continued on the walls of the bridge till 1853, when there was an unfortunate renovation of the structure; new brick-work was put in on the very side where the fern grew, and it has now altogether disappeared. Its remains, have however, received decent sepulture, for it so happened that while the repairs were going on, Mr. Haywood, seedsman and florist of

\* Mr. Watson in his "Cybele Britannica," merely says "Reported on good authority as growing on Ham Bridge, near Clifton-on-Teme." But why not have given the "good authority," which was first my own statement in the *Phytologist*, 1835, then inserted in the "Botany of the Malvern Hills," (1841), and lastly confirmed by Mr. Newman, in his "History of British Ferns," (1844), where with his usual candour he mentions the botanists who had gathered the *Asplenium viride* at Ham Bridge before him. His own visit to the not very picturesque bridge deserves to be quoted. "I had long noted Ham Bridge," says Mr. Newman, "as a locality worthy of a visit, on account of its producing this fern, and resolved to make it an object of pilgrimage. In May last I wended my way from Sapcey Brook, along the rich valley of the Teme, through meadows clothed with luxuriant herbage, and among cattle fit for a Smithfield show. As I approached the bridge, the red bricks of which it is built, and the dry and dusty road which passed over it, seemed in no degree to increase the chance of success; yet on that bridge, facing the roadway and covered with dust, was the identical plant I sought—small indeed, but the species not to be mistaken."—*Newman's British Ferns*, 8vo. pp. 282-3.

Worcester, happened to pass by, and seeing the *Asplenium* prostrate in the road among the bricks, took it up, carried it home, and it now flourishes in his fernery at Wick.

*Polypodium Phegopteris* I have myself never seen within Worcestershire, but it has been *reported* in the Teme Valley, near Shelsley. It may possibly be found in this vicinity, which approaches towards the Salopian border, as the fern is really in its native home about Ludlow.

*Equisetum hyemale* is another rare local species of the Teme valley, having been gathered on the banks of Sapey Brook, by Mr. Thomas Westcombe. *E. sylvaticum* has also been gathered by Mr. Westcombe, near Clifton-on-Teme.

Before taking leave of the Teme Valley, the Abberley Hills require brief mention, though the plants close to their bases and on their declivities have been given among those of the Severn Valley. Yet the hills themselves rather belong to the Teme, commencing as they do at Knightsford Bridge, on the north bank of that river, 8 miles from Worcester, and terminating east of the village of Abberley, and about three miles from Stourport. Thus they form a cat's-back ridge between the vales of Teme and Severn. Their western and northern sides belong to the Silurian system of rocks, while their summits as well as eastern and southern declivities are made up of a trappoid conglomerate, now considered to be of the Permian age, in contact with the new red sandstone. The highest point of the Abberley range according to the Geological Survey is 985 feet, and Woodbury Hill is 880 feet, in altitude. More unpropitious ground for botanizing than the Abberley Hills, I am not acquainted with in Worcestershire, and though the Club have surveyed the hills, and I have myself been often there, nothing rarer than *Hypericum montanum* has ever turned up on the arid conglomerate. Where the Wenlock limestone presents itself, *Clematis vitalba* appears, and the usual vegetation of a calcareous soil.

At Ridge Hill, near Martley, which is on the Abberley axis, I have observed in company with Mr. W. Mathews, abundance of *Anthyllis vulneraria*, and Saintfoin (*Onobrychis sativa*), though perhaps the latter is hardly a true native, though not at present cultivated in the vicinity. We also noticed an enormous quantity of *Bromus erectus* at the place. Here, also, Mr. T. Baxter was fortunate enough, a few years since, to find some quantity of *Ophrys apifera*. All these limestone outbursts are productive, but the surface of the conglomerate hills is barren in the extreme. As a local plant of the Teme Valley, *Trifolium ochroleucum* may be mentioned, which has been gathered by Miss Moseley, at Broadwas. So also has *Lathyrus Aphaca*, which is a very local plant, seldom continuing long in its habitats, but remaining for several years in the corner of a cornfield at Powick, as shown me by our associate, Mr. T. Baxter.

There is a little tract of country north of the Abberley Hills, and eastward of the Teme, extending to the Salopian frontier, and constituting the little Pensax Coal field, including the parishes of Pensax, Rock, and Heightington, about which I have very little information as to its vegetation. It appears to be barren of interesting plants, for the three or four times that I have crossed it, has been unproductive of any thing remarkable. I have observed the Daffodil (*Narcissus pseudo-narcissus*), apparently native here, and by a little stream at Rock gathered *Chrysosplenium alternifolium*.

Before closing the notice of the Plants of the Malvern Division, I may mention one, that if not strictly rare, is of periodical occurrence only. This is the Mousetail (*Myosurus minimus*), mentioned in Withering as an old inhabitant of Malvern Chace, but I have never met with it there, though hunting botanically for a quarter of a century. Last year, however, (1856), Mr. T. Westcombe found it very plentiful in the arable field at the top of the bank beyond Powick Ham, through which the footpath goes. Yet probably in two or three seasons it will be lost again.

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### III. THE AVON OR LIAS DIVISION.

THIS division conveniently comprehends all that southern portion of the county through which the river Avon—the “Warwickshire Avon” as generally termed—flows, bounded eastward by Warwickshire, southward by Gloucestershire, (taking a line from Tewkesbury to Blockley); and its line of demarcation westward being the boundary of the Lias formation from Twining near Tewkesbury, through Croome Park and along the Crowle heights, east of Worcester, to Upper Bentley and Tardebig, near Bromsgrove. Thus the northern termination of this division is a little south of the present Bromsgrove Railway Station, and on a level with Redditch.

This country includes the great mass of the Lias formation in Worcestershire, as well as a portion of Oolite which caps Bredon Hill, and rises to above 1,000 feet on Broadway; but eastward, also, on the Warwickshire border, the new red marl re-appears. It may be examined botanically under three points of view, or sub-divisions.

#### I. THE AVON VALLEY ITSELF.

The “soft-flowing Avon” winding slowly through level meadows from Prior’s Cleeve, on the Warwickshire border past Evesham and Pershore to Tewkesbury, about eighteen or twenty miles, with scarcely any current, presents an aspect rather different to the Severn, at least before the stream of the latter was confined by locks and wiers. The margin of Avon’s placid stream in the lower part of its course displays many beautiful plants not seen in such profusion elsewhere in the county, as the graceful Flowering Rush (*Butomus umbellatus*), contrasted with the brilliant yellow *Lysimachia*, and the *Polygonum amphibium* floating its pink blossoms far in the stream, among labyrinths of Bullrushes (*Scirpus lacustris*), where the deep blue *Libellulæ* are waving their glazed wings lazily in the hot sunshine. The quiet brooks that steal into the wider stream are often starred with yellow Water Lilies (*Nuphar lutea*), while their margins are

blue as the unclouded heavens with wide patches of the marsh Forget-me-Not (*Myosotis palustris*), or splendid with the almost tropical-looking *Iris pseudacorus*; and their surfaces are covered with the curious-formed leaves and purple flowers of the Arrow-Head (*Sagittaria sagittifolia*). To these somewhat recently the *Villarsia nymphæoides* has been added, and near Eckington is the only spot in the county where this beautiful liloid plant has yet been found. *Acorus calamus* has also been recorded by Dr. Nash as growing in the Avon at Pershore; but this was in the last century, and I have never met with a recent botanist who has gathered it.\* The great Water Dock (*Rumex hydrolapathum*), the *Lythra salicaria*, the *Sparganium*, *Glyceria aquatica*, and the Reed (*Phragmites communis*), contribute to the conspicuous vegetation that fringes the level shores of the Avon meadows.

In some places, as at Wyre Piddle, near Pershore, I have noticed boggy spots on waste ground close to the river, that among other plants nourished *Eriophorum angustifolium* and *Pedicularis palustris*, the latter of which is a rare plant in Worcestershire.

Salt springs yet occur in some low places in the Lias country, and in ancient times, a great saline marsh appears to have extended at the eastern base of the Lias ridges from Defford Common to beyond Pirton. Near the saline spring on Defford Common *Spergularia* or *Alsine media* grows, with some quantity of *Enanthe Lachenalii*. This latter plant grows also at Cracombe, as the Club discovered when exploring there, and Mr. Gissing found *Samolus Valerandi*, "very plentiful by the road side between Cracombe Hill and Evesham." The Rev. J. H. Thompson and myself found the *Samolus* also at Defford, three years ago. Even as far as Badsey near Evesham, several saline plants as *Scirpus maritimus* and *Smyrniolum olusatrum* occurred in

\* The only positive evidence I have is that of the late Mrs. George Perrot, of Cracombe, who sent me a list of plants growing near that place, in 1834. In that list she has given the *Acorus*, with the fact that it was found in the Avon, "near Fladbury, and removed to a large pond at Cracombe, where it flourished extremely well."

Mr. Rufford's time, as recorded in Purton; but I am informed by Mr. W. Cheshire, Jun., that drainage has now caused these to disappear. Still, however, *Apium graveolens* appears pretty common in ditches, throughout the stiff clays of the Lias division. *Scirpus maritimus* has been gathered on Defford Common by Mr. G. Reece, of the Museum, Worcester.

As before observed, the *Anacharis alsinastrum* has taken up its abode in ditches connected with the Avon, at Evesham, Pershore, and Tewkesbury. *Potamogeton lucens* and *P. flabellatus* grow in the Avon at Evesham, and *P. gramineus* occurs in the brooks that are tributary to it, with other species. *P. densus* occurs in water on Defford Common, and on Bredon Hill.

## II. HILLS OF LIAS SHALE AND LIMESTONE, WITH THEIR WOODS.

The valley of the Severn is bounded on the east, at a variable distance of from three to five miles by a bold escarpment of grey Keuper marl, which is finely displayed at Crowle, and on this reposes the horizon of the Lias limestone and shale, which occupies a belt of country interposed between the New Red Sandstone of Warwickshire. The Lias limestone crops out in various ridges of no great height, having an escarpment to the west, and many of these heights are thickly clothed with coppicing of aboriginal origin. The usual limestone plants appear on the calcareous escarpments and ridges, but in some instances certain species abound more than others. Thus about Crowle and Huddington, *Lotus tenuis* is particularly remarkable, and the meadows near Himbleton are filled with *Spiræa Filipendula*, offering a pleasing spectacle with their rose-tinged flowers; and somewhat later the bright yellow rigid tufts of *Genista tinctoria* are equally abundant. All about the Trench Woods, near Dunhampstead, *Pimpinella magna* appears in singular profusion, and *Allium vineale* with double and even triple heads, covers the fallows. When the Club visited the Trench Woods in 1855, the arable ground on the eastern side of the woods was copiously studded with the local

*Poterium muricatum*, not previously observed here, and *Bupleurum rotundifolium* was very apparent with its glaucous perfoliate leaves and yellow umbels. *Papaver dubium* delights in this dry soil, and *Cichorium intybus* is very plentiful on the borders of corn fields. *Lathyrus sylvestris* is also partial to the Lias country, and is especially located at and near Tiddeley Wood close to Pershore. In the same wood the Club discovered the rare *Agrimonia odorata*. With regard to the woods on the Lias formation, it may be remarked that they have generally a considerable growth of *Viburnum Lantana*, while the Lime, so common in the woods of the Severn Valley, is absent. The Mountain Ash is also deficient, but *Pyrus torminalis* is found though sparingly.

Cracombe and Coldknap Hills, near Evesham, are the chief eminences on the Lias that deserve particular notice, rising between 400 and 500 feet above the vale of Avon, and here a pretty good list of plants may be noted, as under :

<i>Clematis vitalba</i>	<i>Viburnum Lantana</i>
<i>Delphinium consolida</i>	<i>Helminthia echinoides</i>
<i>Viola hirta</i>	<i>Picris hieracioides</i>
<i>Anthyllis vulneraria</i>	<i>Prenanthes muralis</i>
<i>Mellilotus officinalis</i>	<i>Erigeron acris</i>
<i>Trifolium fragiferum</i>	<i>Gentiana Amarella</i>
<i>Lotus tenuis</i>	<i>Chlora perfoliata</i>
<i>Astragalus glycyphyllos</i>	<i>Erythraea Centaureum</i>
<i>Onobrychis sativa</i>	<i>Cuscuta Epithymum</i>
<i>Vicia lathyroides</i>	<i>Linaria spuria</i> and <i>Elatine</i>
<i>Lathyrus Nissolia</i>	<i>Origanum vulgare</i>
<i>Rubus cœsius</i>	<i>Lamium amplexicaule</i>
<i>Rosa spinosissima</i>	<i>Galeopsis Ladanum</i>
<i>Rosa Doniana</i>	<i>Marrubium vulgare</i>
<i>Rosa rubiginosa</i>	<i>Juniperus communis</i>
<i>Poterium sanguisorba</i>	<i>Orchis pyramidalis</i>
<i>Bupleurum rotundifolium</i>	<i>Ophrys apifera</i>
<i>Sison Amomum</i>	<i>Allium oleraceum</i>
<i>Enanthe Lachenalii</i>	<i>Bromus secalinus</i>
<i>Pastinaca sativa</i>	<i>Brachypodium pinnatum</i>
<i>Daucus Carota</i>	

For many of the plants in the above list I am indebted to my friends the Rev. J. H. Thompson and Mr. T. W. Gissing, and the true native Flora is here only slightly invaded by late agrarian introduction. The *Onobrychis* is so persistent on a calcare-



ous soil, whether of the ancient Silurian or far later Lias formation, or on the Oolite, that its claims as a native plant are pretty strong; while *Linaria spuria* and *Elatine* are interlopers of the latest introduction.

*Cuscuta Epithymum*, which is nowhere else met with in Worcestershire, I give on the authority of Mr. G. W. Sandys; and the same locality for the plant appears on another authority in May's History of Evesham. Mr. Sandys also stated to me that he had gathered *Bupleurum odontites* at Cracombe, but this was as far back as 1834, and some later confirmation is desirable. Our club when at Cracombe in 1854 did not meet with it.

Some other rare plants have been noticed in the Lias Division, and in this district of it, which it is proper to mention. *Lathyrus Aphaca* is put down in May's Evesham, as growing by the road side near that place in a plantation belonging to E. Rudge, Esq., and Mr. W. Cheshire, jun., found it between Evesham and Craycombe in 1854.

*Orobanche elatior*, another local plant, is stated in the list of plants appended to May's Evesham, to have been found in "fields of clover, about the villages of Moor and Wyre;" but the year is not given.

*Cuscuta Trifolii* has of late years got into the clover fields in the Lias division of the county, and Mr. W. Cheshire, jun., gathered it between Badsey and Littleton, in September 1855.

*Lamium maculatum*, was reported by the late Dr. Streeten, of Worcester, as found by him near Defford Common, but this is some years ago.

*Agrimonia odorata* is quite a new acquisition to the Flora of this county, and hitherto only certainly found in the Lias division. It is a larger and more odorous plant than *A. Eupatoria*, with larger *unchannelled* fruit. This was found rather sparingly in Tiddeley Wood, near Pershore, when the club took an excursion to that town in 1855. The discovery was due to the sagacity of our close searching secretary (W. Matthews, Esq., A.M.), who had been previously acquainted with the plant.

*Geranium rotundifolium* a plant often mistaken, certainly grows on a bank by the road-side at Defford, very profusely for some distance, and I should esteem it as native there. I also found it in 1855 between Tiddesley Wood and Pershore.

*Chenopodium hybridum* must also be inserted here, gathered near Evesham in 1850 by Mr. T. Westcombe.

In the late Mr. Purton's time, the Rev. W. S. Rufford resided at Badsey, near Evesham, and Purton has recorded in his "Midland Flora" several interesting and very rare plants he found there. Among these are

*Verbascum Blattaria*  
*Cuscuta Europaea*  
*Oenanthe Lachenalii*  
*Petroselinum segetum*  
*Smyrniolus olusatrum*  
*Sedum dasyphyllum*

*Lythrum hyssopifolium*  
*Limosella aquatica*  
*Senecio viscosus*  
*Salix Lambertiana*  
*Ceterach officinarum*

In the same vicinity, at South Littleton, Mr. Purton records the occurrence of *Euphorbia platyphylla*. Mr. Rufford is now dead, and most of the plants seem to have disappeared from Badsey, as Mr. W. Cheshire, jun., who went there to explore, could meet with none of them, and reports the land there as closely cultivated, and the ditches so deep that nothing can grow on their sides.

Some other plants appear to be lost from the vicinity of Pershore and Evesham, as *Lapsana* (or *Arnoseris*) *pusilla*, *Hypochaeris glabra*, and *Iberis nudicaulis*, formerly found at Pensham Field, near Pershore, as given in the list of plants published in Dr. Nash's History of Worcestershire (1781). This "Pensham Field" was an open common, now enclosed and cultivated, and the club looked in vain for these plants in 1855. *Iberis nudicaulis* was doubtless a fugitive, but the *Lapsana* may perhaps yet lurk about.

The Rev. W. S. Rufford is stated in Purton's Flora to have received *Cynoglossum sylvaticum* from the late Edward Rudge, Esq., growing on the Fladbury road, near Evesham; but the green leaved Hound's-tongue is now no longer to be met with.

Dr. Nash in the Supplement to his History, has particularly mentioned *Scirpus Holoschaenus*, as found at Throckmorton near Fladbury, by Dr. Sheffield, Provost of Worcester College, Oxford; but as no other explorer has ever met with the plant there, or even heard of it, I presume some mistake of designation.

No doubt, however, that the plants of a district are altogether changed by drainage and cultivation, and the altered circumstances cause some to disappear altogether. A remarkable instance of this is shown with respect to the country near Feckenham, eight miles from Droitwich, on the Alcester road. In the early part of the present century here was a large bog, called Feckenham Bog, and dreary moors extended for some distance around. The cottagers of the vicinity dug the turf of the bog for fuel as is still done in Wales, as I was assured by an old resident of the place when I went to the site of the bog a few years ago, and coal was a luxury unknown. Here Mr. Purton mentions to have gathered as products of the bog and moors around:—

*Alisma ranunculoides*  
*Carduus pratensis*  
*Pinguicula vulgaris*  
*Anagallis tenella*  
*Zannichellia palustris*

*Cladium Mariscus*  
*Schoenus nigricans*  
*Carex distans*  
*Chara tomentosa*  
*Sphagnum latifolium*

The site even of the bog is now found with difficulty, cultivated meadows and arable land alone presents itself to the view, and all the above mentioned plants have disappeared from the locality.\*

Some few plants before unrecorded in this division of the county, have lately been met with, as *Fragaria elatior*, specimens of which I received from Mr. W. Cheshire, Jun., of Stratford-on-Avon, gathered by him at Redway on the Ridgway, almost at the eastern verge of the county; and when the club was at Pershore in 1855, the local *Rumex pulcher* was found in

\* One seems to have lingered rather later than the rest, for Mr. Thomas Westcombe, whose eye it would be very difficult for a plant to escape, tells me in a note—"The only locality in which I have found *Alisma ranunculoides* in Worcestershire, is Feckenham Moors—it is doubtful if it now exists there."

Holy Cross Churchyard. The vicinity of the Ridgway, three miles east of Feckenham, has scarcely been as yet explored by the club, though Purton records *Gnaphalium sylvaticum* as growing there, and probably close investigation might detect other local plants. To these may be added *Bupleurum tenuissimum*, on the side of the Worcester road at the third mile from Evesham; and *Thymus Nepeta*, in a shrubbery at Fladbury, from the list of plants in May's Evesham, communicated I believe by Herbert New, Esq., of that place. *Ranunculus parviflorus*, *Petroselinum segetum*, and *Linum usitatissimum*, have also been communicated to me by Mr. W. Cheshire, as gathered by him between Evesham and Elmley Castle, in 1854. He also stated to me, that in 1853, *Anagallis cærulea* was plentiful "between Netherton and Haselor, growing with *Linaria minor*, and *Thymus Acinos*." Mr. Westcombe has gathered *Campanula latifolia* near Evesham, rare in the southern part of Worcestershire, and *Mentha rubra* near Stonebow Bridge. I have also noticed *Gymnadenia conopsea* and *Habenaria viridis* in the Herbarium of the Worcestershire Nat. Hist. Soc., presented by Mr. Suttle, from near White Lady Aston.

The Reed Meadow-grass (*Glyceria aquatica*), is most abundant on the side of the river Avon, as well as *Phalaris arundinacea*. I have gathered *Festuca niglumis*, by no means common with us, on a wall capped with earth, at Eckington. This is absent from Severn Province in the "Cybele Britannica."

Ten or twelve miles west of Evesham is an isolated portion of Worcestershire, watered by the river Stour, about eight miles long and three broad; including the parishes of Alderminster and Tredington, and the town of Shipston-on-Stour. Anomalousy surrounded by Warwickshire, to which our county would be willing enough to transfer it, nevertheless its criminals are sent to Worcester, and its plants must therefore be taken into custody also. I have never myself been conveniently able to reach Shipston, but a young and energetic botanist of Stratford-on-Avon, Mr. W. Cheshire, Jun., has sent me a packet of plants

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collected there by him ; but I find nothing otherwise than indicative of the same Lias country that extends from the base of of Bredon and Broadway, northward and eastward.

*Viola hirta* seems very characteristic of this and other limestone districts, and hence in Worcestershire it is far more common on calcareous soil than on marl or sand ; and if appearing on the latter, it becomes so *smooth*, that dubious specimens might be mistaken for *Viola odorata*. The latter common as it is in rural lanes, has been daggered by the London Botanical Society, as of foreign birth ; but though the white variety may possibly be of garden origin, yet I think the purple race of woody banks and pastures indisputably as wild as the " Dog Violet " itself.

*Gentiana amarella*, and *Brachypodium pinnatum*, gathered by Mr. Cheshire at Shemington Hill, Alderminster, pretty well show its limestone character ; and *Bupleurum rotundifolium* *Scabiosa Columbaria*, and *Erigeron acris*, grow at the same eminence. Mr. Cheshire reports also from Alderminster :—

*Reseda lutea*  
*Rhamnus catharticus*  
*Spiraea Filipendula*  
*Sanguisorba officinalis*  
*Torilis infesta*

*Sison amomum*  
*Cnicus pratensis*  
*Hyoscyamus niger*  
*Salvia verbenaca*  
*Salix pentandra*

*Salix pentandra* I have never seen in Worcestershire, except as planted, and I presume this near Alderminster must be also.

Two very local plants Mr. Cheshire sent me from near Alderminster—*Galium erectum*, and *Valerianella carinata* (*Pedia carinata*, Stev.), and on examination I find no reason to disprove the designations given. I understand, however, that the *Galium* is now obliterated at the spot where it grew.

*Cuscuta Trifolii* seems recently to have become a terrible agricultural pest in the Alderminster country, if I may judge from the mass of specimens that Mr. Cheshire sent me from a clover field at Church-hill, near Alderminster, in 1855 ; for so loaded were the stems of the clover with the parasite, that no nutriment remained there, and the entangled stringy mass could hardly be

believed to have clover among it, but for the flowers of the *Trifolium* just apparent above the interwoven strings of the *Cuscuta*.

### III. THE OOLITIC HILLS OF BREDON AND BROADWAY.

The great oolitic system so well developed in Gloucestershire and Oxfordshire, throws off outlyers from its head quarters into the southern part of Worcestershire, forming the ridge of Broadway and the beautiful quasi-island of Bredon-hill; besides which, various detached fragments of the county, as before adverted to, *swim off* among the neighbouring territory which surrounds them. The oolitic hills based upon the Lias shale descend in easy slopes down to the river Avon, forming the southern boundary of the celebrated vale of Evesham. Strictly speaking the plants of these hills may be considered to belong to the Cotteswold Flora, for several of them located here are found no where else in Worcestershire. Such are *Astragalus hypoglottis*, *Hippocrepis comosa*,\* and *Asperula cynanchica*. The latter grows luxuriantly upon the rocks of Bredon, and profusely upon the top of "the Bambury Stone," a disjointed monument of the past, just below the summit; and also on "the King and Queen," remarkable detached oolitic masses standing abruptly on the southern declivity of the hill, the remains of an ancient landslip, unquestionably within the county, and where an ancient manorial court is held (or at least opened and then adjourned to the Royal Oak public house) for the parish of Bredon. The Saintfoin (*Onobrychis sativa*), beautifies the hill with its pink flowers in several places, by no means a common plant; the noble thistle *Carduus eriophorus* exhibits its globose corolla on the edges of the escarpment westward; and on the declivity

\* In June, 1850, our keen-sighted Secretary, Mr. W. Mathews, Jun., M.A., and myself, when on an excursion to Bredon, found both the *Astragalus* and *Hippocrepis* growing together in some abundance in a large abandoned quarry, about three quarters of a mile south of the camp on the summit of the hill; also still farther southwards, on the grassy bank near the edge of the escarpment—both localities I believe in Worcestershire, most undoubtedly the last, and not far from Norton.

about Comberton and Woollershill, the tall Elecampane (*Inula Helenium*), has been noticed in former years. About the old quarries on the tabular part of Bredon, *Reseda lutea* grows, which is very rarely found in any other part of the county; in similar habitats *Calamintha Acinos* may be found plentifully, and *Linaria minor*. *Onicus acaulis* grows very fine upon Bredon, indeed varieties occur having a stem bearing several flowers. It is likely that on and about the base of Bredon-hill, other plants may be found belonging to the Oolitic flora, such as a *Melittis Melissophyllum* recorded in Professor Buckman's Flora of Cheltenham; and as this division of the county requires closer attention than it has yet received, I would recommend its examination to the members of our club. In a fissure of the precipice below the Prospect-House, I found *Cistopteris fragilis* very fine some years since, certainly a very rare fern in Worcestershire, and I believe that it still occupies its position there, though a fall of the rock has rendered it rather difficult to find.

The following list of plants, then, may be placed as characteristic of the vegetation of Bredon-hill, and it will apply also to Broadway, though as I shall afterwards have to remark, some species appear on the main eolitic ridge of Broadway, that do not present themselves on the Bredon outlyer. In addition to the product of excursions with Mr. W. Mathews, and the Rev. J. H. Thompson, my observant friend Mr. T. Baxter, has favoured me with several localities that he has himself noted.

Clematis Vitalba	Saxifraga granulata
† Reseda lutea	Saxifraga tridactylites
Hypericum Androsæum	Pastinaca sativa
Erodium cicutarium	Torilis nodosa
Geranium columbinum	† Viburnum Lantana
Ononis spinosa	† Asperula Cynanchica
Anthyllis vulneraria	Fedia dentata
† Astragalus hypoglottis	† Scabiosa Columbaria
† Hippocrepis comosa	Hieracium vulgatum
† Onobrychis sativa	Conyza squarrosa
Vicia sylvatica	† Onicus eriophorus
Lathyrus Nissolia	† Onicus acaulis
† Spiræa Filipendula	Carlina vulgaris
Sanguisorba officinalis	† Campanula glomerata
Poterium Sanguisorba	† Campanula hybrida

*Myosotis sylvatica*  
*Chlora perfoliata*  
*Gentiana Amarella*  
*Hyoscyamus niger*  
 † *Linaria minor*  
*Veronica montana*  
*Mentha piperita*  
*Origanum vulgare*  
*Galeopsis Ladanum*  
*Lamium amplexicaule*  
 † *Acinos vulgaris*

*Anagallis cœrulea*  
*Triglochin palustre*  
*Orchis pyramidalis*  
*Epipactis latifolia*  
*Iris foetidissima*  
 † *Potamogeton densus*  
*Blysmus compressus*  
*Triodia decumbens*  
*Koeleria cristata*  
 † *Brachypodium pinnatum*  
*Avena pratensis*

Those plants with the asterisk prefixed, give a characteristic feature to the vegetation of Bredon, and are no where else seen so plentifully in Worcestershire. On the northern declivity of Bredon numerous old and tortuous Hawthorns (*Crataegus oxyacantha*), give a remarkable appearance to the hill side, and there are also many trees of Maple (*Acer campestre*), that from their size must be very old.

[It must be remarked that *Buxus sempervirens* appears in some of the woods near Norton, but has been planted there.]

Bredon-hill and the oolitic country is not prolific in Ferns, though as before-mentioned the pretty Bladder-Fern (*Cystopteris fragilis*) grows in crevices of the northern side of the escarpment. The Rev. Lister Isaac has gathered *Ophioglossum vulgatum* at Comberton (1851); and Dr. Nash reported *Botrychium Lunaria* on the "north side of Bredon Hill" in the last century. I have heard of no recent find of it.

In Mosses, my friend Thompson has given me *Neckera crispa*, which he gathered here, quite a rarity in Worcestershire, though abundant in the woods of the calcareous Cotteswolds. Probably other local species may be found.

Lichens, especially the lapideous ones, are profuse and characteristic, the stone walls being singularly whitened with effused patches of *Urceolaria calcarea* and *cinerea*, while on the ground the stones are black with *Collema nigrum*. In Bafton's Wood I have observed large patches of the velvet-like dark *Chroolepus ebenea* on the moist earth, and the trunks of a plantation of beeches were rendered of a sable hue from the exuberant growth



of another obscure alga of the same family. It is probable, therefore, that a resident cryptogamist might make some interesting discoveries.

#### BROADWAY HILL.

Broadway forms a part of the main Oolitic system so widely developed in Gloucestershire, based upon the Upper Lias Shale, and at this point protrudes a feeder into Worcestershire, forming on its northern slope a steep glacis into the Vale of Evesham. Its altitude is 1086 feet, and though as regards Worcestershire forming a mere peninsula of the county, yet after a short break of Gloucestershire interposed, an isolated portion of Worcestershire again extends still further south between Broadway and Bourton-on-the-Hill, so that it would be inexcusable to take no note of the Broadway plants, though strictly referable to the Flora of the Oolite. These are difficulties a county botanist must always encounter, and this interlapping of counties may often render double localities to be given for the same plant, as stated by bordering botanists, each anxious to "hold his own." But zealous only for truth, myself, I shall state the facts that present themselves candidly.

I shall first of all record the plants at Broadway that are certainly within the Worcestershire line of demarcation, including Blockley and the Vale of Dove, the latter watered by a little stream descending from the Oolite to the river Stour near Tidmington.

*Monotropa Hypopitys.* This plant I received many years ago from Sir Thomas Phillipps, Bart., as growing at the roots of beech trees in his plantations at Middle Hill. I have not seen it growing in any other part of Worcestershire, or even heard of it from any living botanist. At Middle Hill, Mr. W. Cheshire, Jun., again found it in 1855, in a plantation near the Tower on the summit of the hill, not only under beeches but under firs, "growing on the fallen fir-leaves which are matted together by a substance resembling very much like [the fungoid filaments called] *Auзонium auricomum*, except that it is not of such a golden

tinge." It is in fact the peculiar habit of the *Monotropa* to grow upon fungous mycelia entwined with dead leaves and rotting roots, and this gives it a sub-parasitical aspect, but it only seizes upon roots that are in such a rotting state as scarcely to be distinguished from filamentous fungi. The *Monotropa* was coming up so profusely in the fir plantation at Broadway, when Mr. Cheshire examined it, that he considered thousands of flowering stems would soon be developed. He afterwards met with the plant again under beeches in Dovedale, Blockley.

*Sinapis alba*. This mustard distinguished by the swollen bristly base of its pods, Mr. W. Cheshire has sent me from Broadway, though located in the adjoining parish of Snowhill; but a plant of this kind is likely enough to extend itself, and must probably be in Broadway also. It occurs nowhere else as a Worcestershire plant, unless near Bewdley, put down in Mr. Jordan's list, but not confirmed by other observation.

*Campanula* (or *Specularia*) *hybrida*. This is now very plentiful in the arable fields on Broadway, and in an excursion of the Club in June, 1856, we observed in traversing the Broadway country from Weston-sub-Edge by Old Comb and Northwick Park to Blockley, numerous plants with flowers varying from deep to light purple, and even white. Yet it must be remarked that this species must have been introduced on Broadway Hill since its enclosure and cultivation.

*Arenaria tenuifolia*. Mr. Cheshire sent me this from Broadway, and I have it from no other district in Worcestershire.

A few other plants may be mentioned as occurring on Broadway Hill and within Broadway parish, that are uncommon within Worcestershire except on the Oolite. These are *Asperula cynanchica*, *Reseda lutea*, *Campanula glomerata*, and *Scabiosa columbaria*. These may all be esteemed as truly native at the spot.

Among the abandoned quarries on the road side, the usual limestone plants may be seen, as *Anthyllis vulneraria*, *Onobrychis*

*sativa*, *Poterium Sanguisorba*, &c., but I have no report of Orchids, though their occurrence would seem probable. *Carduus acaulis* grows commonly on waste spots. The following also may be mentioned as putting in an appearance, and a larger list of general plants could be made if necessary, including Blockley; but except in particular spots the Oolite is rather barren of interesting plants. At any rate in a very long ramble few of much interest would occur in the open country.

*Rhamnus catharticus*  
*Rosa tomentosa*  
*Rubus Idæus*  
*Sedum acre*  
*Saxifraga granulata*  
*Viburnum Lantana*  
*Adoxa Moschatellina*  
*Valerianella dentata*  
*Lactuca muralis*

*Campanula Trachelium*  
*Gentiana Amarella*  
*Veronica Buxbaumii*  
*Thymus Nepeta*  
*Galeobdolon luteum*  
*Galeopsis versicolor*  
*Blymus compressus*  
*Avena pratensis*  
*Equisetum palustre*.

*Colchicum autumnale* grows in a wood at Snowhill, and thus its adaptability is shown to every kind of soil, from the alluvial Severn meadows to the limestone of the Silurian hills, and the debris of the Oolite. It occurs here at 1000 ft. of altitude.

SNOWSHILL, BROADWAY.—It is a singular circumstance that although the highest part of Broadway Hill is in Worcestershire, and another portion including Blockley and Dovedale is quite in the heart of the Oolitic country, that yet the rarer plants that rejoice in the calcareous Oolite, are really located *outside* the county boundary, or rather between two of its peninsular or islet-like portions, and have selected to cluster in and adorn the adjacent parish of Snowhill. Thus the Pasque-flower (*Anemone Pulsatilla*), the Whitebeam (*Pyrus Aria*), and the rare fern *Polypodium calcareum*, all grow in Snowhill parish.\*

A curious collection of native plants are to be found at a waste place in Snowhill parish called Hyate's Pits, and three of these, though so near the Worcestershire boundary, are quite unknown at any locality within the county. Mr. W. Cheshire who has

\* These and various other plants of the Oolite country do not descend into the Vale of Severn, so that "Severn Province" as defined by Watson in his "Cybele" appears to me as not agreeing with the natural distribution of our indigenous vegetation.

investigated the botany of the south-eastern Worcestershire border with much ardour and industry, particularly called my attention to "Hyate's Pits," where he informed me he had gathered *Thlaspi perfoliatum*, *Arabis hirsuta*, *Sinapis alba*, *Hippocrepis comosa*, *Pyrus Aria*, *Saxifraga granulata*, *Cineraria campestris*, *Campanula glomerata*, *C. Trachelium*, and *Thymus acinos*. Here, also, he collected *Orchis Morio*, with white flowers.

In the same vicinity the Pasque-flower (*Anemone Pulsatilla*) flourishes at an early period of the year, and *Alsine tenuifolia* grows close by. At this spot, too, the local fern *Polypodium calcareum* may be met with. "Woes cluster," it has been truly said, and in like manner rare and remarkable plants congregate together in favoured localities, and this is a remarkable instance where several rare species have crowded in company at a spot only a short distance from our county border, and seem studiously to avoid crossing the boundary line. I have, however here recorded their location, because it is possible that some future change of circumstances, or accident of migration, may really plant them in Worcestershire. In fact, Mr. Cheshire afterwards sent me specimens of the very local *Thlaspi perfoliatum*, from Evenlode, which is a detached parish of Worcestershire, surrounded by Gloucestershire. It had never been noticed there before. Still it must be admitted that the Pasque-flower, the Thlaspi, and the Cineraria, are truly plants of the Cotteswolde Hills, and have no claim to be included in a strict list of "Severn" plants. The southern end of Worcestershire, however, as it takes in Bredon Hill, necessarily impinges on the Oölite, and the plants attached to it, as well as includes the parish of Broadway.

Hyate's Pits, my friend Cheshire tells me, "is a large abandoned space of ground, which seems to have been quarried all over, and the useless stone and rubbish thrown into heaps in the place nearest to hand, and there left. This must have been done years since, as they are now covered with a thin layer of

fine black vegetable mould, which in its turn is covered with a beautiful carpet of lichens, mosses, and grass, spangled and adorned with *Ranunculus bulbosus*, *Saxifraga granulata*, *Polygala vulgaris*, *Orchis mascula* and *Morio*, &c. The *Thlaspi perfoliatum* grows in three of the hollows or valleys between these hillocks, at the edge of a basin about two yards in diameter, in which water rests in the winter. The plant grows amongst the mosses and stones at the edge of this pool or fog-pond, and is of a very small size." The plants that Mr. Cheshire\* forwarded to me were truly diminutive, though not the less characteristic.

I omitted to mention that my friend before mentioned gathered *Cerastium arvense* on Broadway Hill, which is a very rare plant in Worcestershire. Native woods are scarce upon the Oölite, but in a note I received from Mr. Cheshire he says—"I have at length found a natural wood in Broadway, but it is so overgrown with rank vegetation, that I cannot see much of what there is except *Allium ursinum*, which actually carpets the ground." A few isolated woods occur on the sides of Bredon Hill, and in them I have gathered *Veronica montana*, and *Vicia sylvatica*.

Cultivation has extended itself nearly over the whole of Bredon Hill, with the exception of the area of the camp on its summit, and the broken precipice and the ground at its base northward. The weeds of agriculture have intruded accordingly, *Carduus nutans* crowding some spots, and I have noticed *Veronica Buxbaumii* growing in the arable fields, and *Linaria Elatine* extending itself most luxuriantly. Miss Woodward also sent me a specimen of Venus's looking-glass (*Campanula*

\* I have to deplore the loss of this ardent field botanist, who died at Stratford-on-Avon, in the prime of life, and reposes under a tablet raised to his memory, in the churchyard there, by subscription of those who esteemed him while living. He was a faithful observer and self-taught botanist, and might have become eminent had he been permitted a longer date upon the flower-clad earth.

*Speculum*), gathered in a field on Bredon Hill.\* This plant, although so common on the Continent, has never hitherto been admitted into the British Flora, even as a straggler.

At Middle Hill, Broadway, and throughout the Cotteswolds, are numerous plantations of Beeches, a tree that thrives well upon the Oölite; but it must be understood that the Beech, whatever may be its claims to true nativity in Buckinghamshire, can here, and indeed throughout the whole of the "Mid-Severn Province," only be considered as a tree introduced by the hand of man.

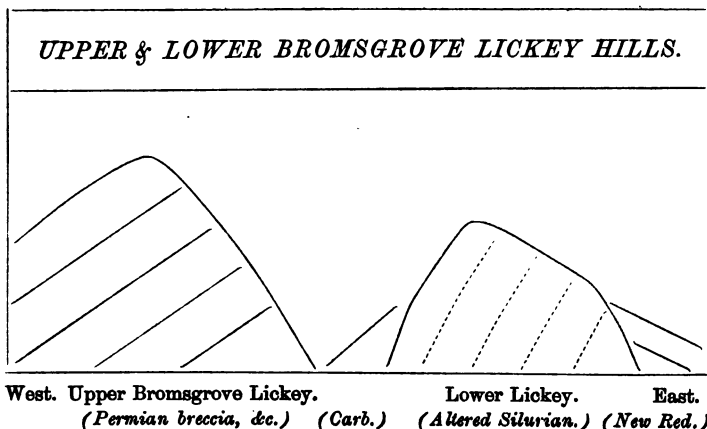
Lichens are excessively abundant upon the Oölite on Broadway, wherever it is exposed, and especially upon the stone walls that here form the boundaries of property. *Urceolaria calcarea* and *cinerea* completely encase the surface of stones with a white armour crowded with apothecia, nor is *Lecidea immersa*, that gives the calcareous surface such a curious pitted appearance, less abundant. The nature of the stone is also extremely favourable to the *Verrucaria* tribe, several prominent species of which are to be met with, as *V. muralis* and *V. rupestris*; while *Collema nigrum* stains broken slabs so as often to give them a very sooty aspect, even when no fruit can be detected. These sable lichens are occasionally relieved by the yellow thallus of *Squamaria murorum*, that creeps in among them and puts in its claim for the possession of the stone. No doubt a good collection of lapideous lichens might be made on Broadway by any cryptogamist interested in the subject.

On exposed portions of the higher ground of the hill, *Cladonia rangiferina* and the dark twisted and brittle *Cornicularia aculeata* extend themselves; and near Hyate's Pits Mr. Cheshire gathered *Endocarpon lachneum*. The rocks at Saintbury, Broadway, produce *Opegrapha tesserrata*, De Candolle.

\* The height of Bredon Hill, is stated by Captain Yolland, C.E. in the Ordnance Survey, to be 979 feet.

Mosses appear not to be very numerous here, with exception of the *Tortulæ*; and I have neither myself gathered or heard of any local or rare species, except *Encalypta streptocarpa*, and *Orthotrichum anomalum*.

It is remarkable that Gorse (*Ulex*), so common upon the Malvern Hills, is here entirely absent.



#### IV. BROMSGROVE LICKY DIVISION.

In general terms this division may be said to extend from Headless Cross and Tardebigg on the south, to Yardley and Birmingham northward, and including Halesowen and the town of Dudley, with its vicinity, encloses the Wichbury, Hagley, and the Clent Hills on the West. In detail the country to which the above name is given, is that triangular portion of the county lying in proximity to the town of Birmingham, cut off on the south-west by a line which, drawn from the Staffordshire boundary at Stourbridge, passes by Hagley and Bromsgrove, and enters Warwickshire near to Redditch. Including the outliers of Dudley, and the intervening part of Staffordshire, it will contain the basaltic hills of Rowley, and those of Clent and Bromsgrove Lickey, which, rising from an upland district, attain heights varying from 800 to 960 feet. The north-western corner of the triangle forms the southern



extremity of the South Staffordshire Coal Field, and the district doubtless owes its elevation to the forces which thrust the coal measures through the superincumbent beds of the new red sandstone.

There is considerable variety of geological structure in the division thus named from Bromsgrove Lickey. It contains the Wenlock Limestone of Dudley, the basalt of the Rowley Hills, the coal measures of Halesowen and Cradley, the red Permian clays and conglomerates to the south of Halesowen, the remarkable breccia of the Clent Hills, the Upper Bromsgrove Lickey and Frankley Beeches; as well as the New Red Pebble-beds on the flanks of the Clents and Lickey, the altered Llandovery beds of the Lower Lickey (Silurian System), and the red marl extending from Yardley to Redditch. The differences in the soil are much less than might be expected from such a number of deposits, and clay, either of Coal-measure, Permian, or K  uper age very largely preponderates.\* (*See sketch.*)

The long ridge of land commencing at Dudley, including the Rowley Hills, and running by Frankley Beeches, parallel to the Clent and Lickey ranges, and to the north-east of them, is part of the great water-shed of central England, which divides the drainage of the Severn from that of the Trent. Omitting a few insignificant tributaries of the Salwarp, the streams on the south of the water-shed may be divided into the sources of the Stour, which, rising between Frankley Beeches and the Clent Hills, flows by Halesowen and Cradley, entering the Severn at Stourport; and those of the Arrow, which rises near Alvechurch, and passing by Redditch, runs into the Avon at Salford Priors. The streams on the north of the water-shed are the Cole and the Rea, which are affluents to the Tame, and so by way of

\* For these particulars of the geological structure of the Bromsgrove Lickey Division, and also its physical and geographical features, I am indebted to my acute friend Mr. W. Mathews, Jun., A.M., F.G.S., who from long observation is so intimately acquainted with the northern part of our county.

Tamworth at length reach the Trent. Thus three natural subdivisions of country are here presented, according as the drainage is into the Stour, the Tame, or the Avon ; but the vegetation is rather governed by elevation and soil than marked by anything peculiar to each river valley.

From the considerable mean elevation of the Bromsgrove Lickey country, and its excess of humidity over other portions of the county (for the average fall of rain registered at Birmingham amounts to about  $25\frac{1}{2}$  inches),\* the climate is less genial than in the south or west (mean temperature about  $48^{\circ}$ ), and its vegetation consequently more backward ; but from its situation and northern exposure the Lower Lickey range presents a much more sub-alpine aspect than the Malvern chain, which is nearly 500 feet loftier. The Clent Hills, however, and the Upper Bromsgrove Lickey, being composed of trappoid breccia, are singularly barren of plants, nor do the basaltic Rowley Hills present any remarkable species, though as soon as the Wenlock strata are touched upon, at Dudley, most of the plants that luxuriate on limestone are observable, and one, the *Atropa Belladonna*, which is nowhere else to be certainly met with in Worcestershire. But I shall notice particular and favourable botanical localities farther on. When once the limestone is left on the confines of the "Black Country," as about Cradley and its vicinity, blast furnaces, tall chimneys, &c., scatter smoke and carbonaceous particles around to such an extent, as to be very discouraging to the growth of vegetation, and disappointing to the explorations of the botanist. So inimical is the ever-smoking cloud, derivable from mining and smelting works, to the existence of delicate cryptogamic vegetation, that our active associate, the Rev. J. H. Thompson, Incumbent of Cradley, informs me that scarcely a lichen can be found upon the bark

\* The variation in the rain-fall of different years is so considerable, that the mean stated is scarcely to be depended upon, and ought to be placed higher. Mr. O. Smith, of Birmingham, sent me, as observed by him—1861, 29.75 in. ; 1862, 31.31 in. ; and 1863, 24.56 in.

of any of the stunted trees that are scattered about his populous parish ; and even the pools are so girt around with cinders and rubbish, that aquatic plants formerly growing there are no longer to be found.

#### PLANTS OF BROMSGROVE LICKY.

It may be convenient, in alluding to the remarkable botanical stations in this district, to subdivide, or at least to note, the places most remarkable for what Humboldt calls the physiognomy of vegetation ; for the appearance of the Silurian heights near Dudley, and the bare basaltic Rowley Hills, is very different to what Bromsgrove Lickey exhibits, the hills of the latter, densely covered with Ling, Heath, and Bilberry bushes, presenting quite a sub-alpine aspect.

The Upper Bromsgrove Lickey forms a bare ridge of "Permanian" trappoid breccia, of the same age and formation as the Clent Hills, with which it is geologically connected, and rising to the height of 960 feet, it dominates over the hills of the Lower Lickey, which, composed of metamorphic quartzose rock or changed "Llandovery" strata, form a transverse line, stretching from south-east to north-west, with deep glens between each hill, winding through one of which the old road from Bromsgrove to Birmingham passes by the well-known inn, the Old Rose and Crown. The Upper Lickey, as well as the Clent Hills, are very barren of phanerogamic plants, and it only deserves to be noted that on the former, where a clump of Scotch firs of about a century's growth rise above the Bilberry wyres that here robe the height, the local *Rubus Sprengelii* creeps among the Bilberry bushes, and presents a very characteristic appearance.

The Lower Lickey is so densely covered with Bilberry bushes (*Vaccinium myrtillus*), as to bear the common name of "the Bilberry Hills," and when, after summer, the leaves of the shrub become tinged with red, they present a remarkable

appearance. Some spots are densely clothed with Ling (*Calluna vulgaris*), and there are boggy places where the *Erica tetralix* shows its pretty bells, and the *Sphagnum* spreads its grey tresses on the soil. The *Erica cinerea* is also common, and neglected spots and waste places abound with tufts of the autumnal gorse (*Ulex Gallii*), which becomes here excessively thorny and shrubby. The glandular bramble, *Rubus scaber*, W. and N., is also here in excessive abundance, even on the tops of the hills, and often very beautiful, its deep red flowers and glandular calyx looking like little roses. Other brambles occur, as *R. Bellardi*, *R. K  hleri*, *R. villicaulis*, *R. tenui-armatus*, and *R. suberectus*. The Raspberry (*R. Id  us*) also forms tall shrubby masses on the sides of the Bilberry Hills. *Rosa Sabini* occurs rarely, but *R. villosa* and *R. rubiginosa* are not uncommon.

The Mountain Ash (*Pyrus aucuparia*) is plentiful on one of the Lower Lickey Hills, and in some of its glens the Birch (*Betula alba*) grows much branched, although rather dwarf; while the Holly (*Ilex aquifolium*) is everywhere abundant, and some of the trees are very large, forming picturesque clumps in several spots. Of late years Scotch and Norway Firs have been planted on the hills, and now form dense coverts there.

The appearance of the little old-world chain of the Lower Lickey, which is supposed to be "on a line of former eruption," is very peculiar. It is shut in to the south and west by the heights of the Upper Lickey of "Permian" conglomerate, which rise considerably above it, but to the north the landscape expands to Birmingham, and the high ground that extends westward to the Rowley Hills and Dudley. In one place, standing upon Rednall Hill, a depression between the Lickey Beacon and the Clent Hills, opens a pleasing vista to the distant Clee Hills, in Shropshire. It is curious to contemplate this low characteristically black chain of broken summits curling in a north-west direction through a highly cultivated country that impinges upon its very base, while the eye follows the low range about two

miles farther, till it suddenly terminates in a round islet-like boss beyond Rubery, called the Holly Hill (perhaps holy-hill, from ancient veneration), densely covered at the present time with gorse (*Ulex europæus*). This is probably a late introduction, for *U. Gallii* prevails elsewhere.

Before the waste around the bases of the hills was enclosed by Act of Parliament, in 1796, there was a great extent of boggy ground about the Lickey, and Mr. Pitt, in his "Agriculture of Worcestershire," records the draining of a very large bog by Mr. Carpenter, of Chadwick Manor. These bogs nourished the Cranberry (*Vaccinium Oxycoccus*), the *Narthe-cium ossifragum*, the Bog Violet (*Viola palustris*), and probably other bog plants unrecorded. I have gathered the *Narthe-cium* and the *Viola palustris* at the southern base of Rednall Hill up to 1854, but the Cranberry has long disappeared.\* At last, even the small boggy bit of ground that nourished the *Narthe-cium* and Bog-violet has been "taken in," and the place where I knew them will know them no more. There are still some squashy places in the woods about, and in one of these I unexpectedly, not long since, came upon a great quantity of *Equisetum sylvaticum*. In wet places about the Clent Hills the *Equisetum sylvaticum* abounds, as well as *Carex fulva*.

Among the characteristic plants of the Lickey, the following may be mentioned as usually occurring :—

<i>Aquilegia vulgaris</i>	<i>Rosa villosa</i>
<i>Corydalis claviculata</i>	—— inodora
<i>Nasturtium terrestre</i>	<i>Epilobium angustifolium</i>
<i>Drosera rotundifolia</i>	—— montanum
<i>Malva moschata</i>	<i>Hydrocotyle vulgaris</i>
<i>Hypericum pulchrum</i>	<i>Sison amomum</i>
<i>Rhamnus frangula</i>	<i>Adoxa moschatellina</i>
<i>Lotus major</i>	<i>Senecio sylvaticus</i>
<i>Geum rivale</i>	<i>Veronica montana</i>

\* An old maiden lady, named Barford (now dead), who was a confectioner, at Birmingham, more than thirty years ago, informed me that she used to make Cranberry tarts with berries from the Lickey Hills; and I have met with Bromsgrove persons who testified to eating the Bromsgrove Cranberries. An old inhabitant of the Lickey once pointed out a spot to me where, he said, the cranberries used to grow. The enclosure of the country destroyed them.

*Jasione montana*  
*Orobanche Rapum*  
*Digitalis purpurea*  
*Mentha Pulegium*  
*Lamium Galeobdolon*  
*Veronica montana*  
*Plantago Coronopus*  
*Polygonum Bistorta*  
*Populus tremula*  
*Epipactis latifolia*  
*Juncus squarrosus*  
*Triglochin palustre*  
*Scirpus cæspitosus*  
*Eleocharis acicularis*

*Eriophorum angustifolium*  
*Carex dioica, pulicaris, stellulata,*  
*Pseudo-cyperus, binervis, ampulla-*  
*cea, pallescens, remota, and pilu-*  
*lifera*  
*Molinia cærulea*  
*Nardus stricta*  
*Triodia decumbens*  
*Aira flexuosa and caryophyllea*  
*Lastræa Oreopteris and dilatata*  
*Blechnum boreale abundantly*  
*Cistopteris fragilis*  
*Athyrium filix-fœmina*

It must be understood that some of the above are to be sought within the woods about the base of the Lickey Hills,\* the hills of the Lower Lickey being mostly choked with a dense growth of Ling, Heath, and Vaccinium, or grey with *Cladonia* where the soil is quite exposed, and occasionally there occurs a boggy space spongy with *Sphagnum*. But *Nasturtium terrestre*, *Mentha Pulegium*, *Sagittaria sagittifolia*, &c., are located by the side of the great reservoir connected with the Worcester and Birmingham Canal. The Cowslip (*Primula veris*) is but scantily distributed in the Bromsgrove division, and what is commonly called "Oxlip" (the caulescent variety of *Primula vulgaris*), is of unusual occurrence.

The Green Hellebore (*Helleborus viridis*) was once found by the Club in a wood between Bromsgrove and Frankley; and Soapwort (*Saponaria officinalis*), and *Hesperis matronalis* have both been occasionally met with as apparently of Nature's planting; † but I should doubt their fixity of position. There

\* It has been suggested by Dr. Nash and others that the name Lickey has been corrupted from *look-high*, the original designation of this eminence. But the range, though commanding a wide prospect, by no means *looks* very high, and it seems more probable that the name is derived from *lockia*, a Scandinavian word, signifying a *shut up* place, which the valley in the Lower Lickey, near the old Rose and Crown, appears at a little distance to be—and quite out of the world. Hollingshed calls the Lower Lickey "the Blacke Hills," and robed in the tempests of winter, they must, in former times, have presented a very dismal aspect.

† The *Hesperis* was communicated to me by Mr. R. Smith, of Westacre, Droitwich, well known to the Club by his horticultural predilections, and whose heartiness of welcome was oft experienced, but, alas, cannot be again, as he was taken from us by death, in 1865.

can be no doubt that the Columbine (*Aquilegia vulgaris*) is of endemic growth in the woods here, as indeed it truly is both in the Severn Valley and Malvern divisions.

One remarkable fact may be mentioned with respect to the botany of Bromsgrove Lickey, as showing the vegetable changes that may occur periodically in places, under a disturbance of the soil after long repose. The fact is mentioned in Carpenter's "Agriculture of Bromsgrove," a work in two thin volumes, which was published soon after the enclosure of the Lickey, in the latter part of the last century. Mr. Carpenter, who resided at Chadwick Manor, mentions that the newly-made arable fields there were infested with the *Delphinium consolida*, to which he gives the vulgar name of "Stavesacre," and directs its destruction as a most pernicious weed, and, that the farmers might know it with the greater certainty, he gives a representation of the plant as a frontispiece to his book! I have never myself heard of the Larkspur, or "Stavesacre," as a corn weed in Worcestershire, and I presume that Mr. Carpenter hunted it to annihilation. It would seem, however, that the plant appeared in the way it did only upon the fresh breaking-up of the Lickey soil after the Enclosure Act, many analogous instances of which have been known, and, after remaining a few years, it gradually died away. The Larkspur is still mentioned as to be found in the chalky cornfields of Cambridgeshire, but it is very rarely indeed seen astray from a garden in this county.

As a circumstance somewhat analogous to this, I may mention that two years since I observed a bare space on one of the Lower Bromsgrove Lickey Hills (Rednall), which had been recently laid bare by the turf, &c., having been pared away, and instead of the former occupants of the soil again growing, a quantity of *Senecio sylvaticus* was springing up, and seemed likely to cover the entire space. In a cleared part of a coppice near Worcester, I once noted *Borago officinalis* springing up in a similar way—thus showing how ready seeds accidentally blown about are to take possession of any soil left open to occupation, or unappro-

priated by changing circumstances. Bromsgrove is thought to owe the first syllable of its name to the quantities of Broom (*Sarothamnus scoparius*) once growing there, and the railway cutting between Barnt Green and Bromsgrove Station has recently become overgrown with the same shrub.

#### CRYPTOGAMOUS PLANTS OF THE LICKEY.

The subalpine character of the Lickey Hills causes them, where their wild heathy state still remains, to exhibit a considerable number of Cryptogamic plants, among which, the Reindeer Lichen (*Cladonia rangiferina*) is abundantly conspicuous with its branched silvery-looking fronds. In some places, too, the ground is darkened with brittle tufts of *Cornicularia aculeata*, while the sides of the pathways in the broken soil of the hills is quite encrusted with a most dense growth of the little green moss *Bryum androgynum*. The grey Lichen *Bæomyces rufus*, with its brown apothecia, is also not uncommonly seen coating the moist soil, and occasionally the black *Verrucaria epigæa* is apparent. Among the tufts of ling in moist shady spots, the silvery moss *Dicranum glaucum* appears, and the dark green velvety *Dicranum heteromallum* is very abundant. The spongy *Sphagnum* in a dwarf state covers the ground in boggy places, while on dry declivities *Hypnum splendens* is plentiful, as well as *Dicranum scoparium*. Various *Hypna* cover the soil and the boles of old stumps, the most conspicuous of which is *Hypnum undulatum*. Several *Polytricha* are also observable, as *Polytrichum juniperinum*, *piliferum*, *aloides*, *urnigerum*, and *commune*. Other mosses may be enumerated, as *Bryum hornum*, which is rather plentiful by the side of rills, as well as in copses, and also *B. cæspititum* on walls and in shady places. Besides these, *Tetraphis pellucida*, *Weissia controversa*, *Didymodon purpureus*, *Dicranum taxifolium*, *D. scoparium*, and *Orthotrichum rivulare* may be gathered, so that a student of "mosses wee," as Spencer calls them, is not likely to be disappointed.

Among more obscure cryptogamic productions may be noticed the *Coccochloris Grevillei* of Hassall, (*Palmella botryoides* Grev.),



whose fronds of densely crowded gelatinous beads congregate on moist spots; as well as *Ulva crispa*, which in particular places forms a wide-spreading velvety-green growth of pretty aspect. A few *Jungermannia* appear here and there in wet localities and in shady hollows of the hills, but not in any great quantity. I have gathered *J. epiphylla*, *J. pinguis*, *J. compacta*, *Roth (resupinata, Hook.)*, *J. asplenoides*, *J. serpyllifolia*, and *J. undulata*.

The most abundant of the Lichen tribe, not even excepting *Cladonia rangiferina*, is *Parmelia physodes*, which covers old paling and dead stems of ling and heath most abundantly, though it seldom or ever produces apothecia. On the Malvern rocks the Lichens are very varied, but here *Parmelia physodes* almost exclusively occupies the ground. A few *Collema* blacken the soil in exposed places, and I have also gathered *Borreria furfuracea*, and *Lecidea quadricolor*, Hooker.

As might be expected, the Cup-Mosses (*Scyphophori*) are abundant on heathy ground in a variety of forms, nor is the pretty red-tipped *S. cocciferus* at all uncommon.

The tribe of Fungi in their various forms abound on the Lickey in the autumnal season, and a long list might be made out. On the edge of a plantation near the Obelisk, my friend Mathews showed me the edible *Agaricus deliciosus*, and the *Cantharellus cibarius* is not uncommon. Various *Clavariae* may also be met with, both large and small. I gathered here the very rare *Phallus caninus*, in 1856, and I believe that it has been nowhere else met with in the county. To a diligent Cryptogamous botanist the hills and glens of the Lickey would furnish a rich harvest. One part, however, enclosed by Lady Windsor for the preservation of game, requires to be furtively trodden.

### MOSELEY BOG AND POOLS.

Next to Bromsgrove Lickey, the pools and relics of bogs at Moseley (within the basin of the "Sparkbrook" so called on maps, an affluent that falls into the Cole, and flows on eventually to the

Trent), deserves to be mentioned, though, alas, the interest attaching to it is now chiefly retrospective. Before Moseley Wake Green was enclosed (which I remember in its integrity) and the bogs drained, this must have been a locality of surpassing interest, and even now, though the bogs are almost extinct, yet as several pools yet remain, a stroll along their margins may still discover the last relics of a banished race. I here give a list of remarkable plants once growing here, as recorded by the late Dr. Ick, of the Philosophical Institution, Birmingham, and by Miss M. A. Beilby and Mr. E. W. Benson in "The Analyst" for July, 1837.

## PLANTS OF MOSELEY AND ITS VICINITY.

<i>Thalictrum flavum</i>	<i>Centunculus minimus</i> , "Moseley Wake Green" (B.)
<i>Cardamine amara</i> (Ick)	† <i>Anagallis tenella</i> , "Moseley Bog" (Ick)
† <i>Viola palustris</i>	<i>Veronica scutellata</i>
† <i>Drosera rotundifolia</i>	† <i>Pedicularis palustris</i>
† <i>Hypericum elodes</i> , "in a drained mill-pool on Moseley Common" (B.)	† <i>Scutellaria minor</i> , "Bog on Moseley Common" (B.)
<i>Dianthus deltoides</i>	<i>Juncus squarrosus</i> , "Moseley Bog" (Ick)
<i>Arenaria tenuifolia</i> , "Gravelly fields, Yardley" (B.)	<i>J. sub-verticillatus</i> (Ick)
<i>Stellaria nemorum</i> , "field in Hob Lane, Yardley" (B.)	† <i>Narthecium ossifragum</i>
<i>Radiola millegrana</i>	† <i>Rhyncospora alba</i>
<i>Cerastium aquaticum</i>	<i>Triglochin palustre</i> (Ick)
<i>Parnassia palustris</i>	<i>Eriophorum vaginatum</i>
<i>Rhamnus frangula</i>	† <i>E. angustifolium</i>
<i>Ornithopus perpusillus</i>	<i>Eleocharis palustris</i> , "Moseley Common" (Ick)
<i>Potentilla comarum</i> , "Pool on Moseley Common" (B.)	† <i>Carex stellata</i> , <i>remota</i> , and <i>panicca</i>
† <i>Helosciadium inundatum</i>	† <i>C. binervis</i> , <i>cæspitosa</i> , and <i>vesicaria</i>
† <i>Oxycoccus palustris</i> , "bog on Moseley Common" (B.)	<i>Molinia cærnulea</i>
<i>Dipsacus pilosus</i>	<i>Aspidium oreopteris</i>
† <i>Cnicus pratensis</i> (B.)	<i>A. dilatatum</i>
<i>Anchusa sempervirens</i> , "near Moseley Hall" (B.)	† <i>Osmunda regalis</i> , "Moseley Common" (Ick)
† <i>Plantago coronopus</i>	<i>Equisetum sylvaticum</i> and <i>E. hyemale</i> , "Moseley Bog" (Ick)
† <i>Erica tetralix</i> and <i>E. cinerea</i>	† <i>Lycopodium Selago</i>
† <i>Menyanthes trifoliata</i>	

The plants in the above list with the dagger (†) prefixed are included both in Dr. Ick's list, dated 1838, and also in that of Messrs. Beilby and Benson. But though the plants of the latter were only recorded in 1837, I apprehend that some of them had been gathered many years earlier. *Cnicus pratensis*, *Scutellaria minor*, and *Rhyncospora alba* are recorded by Mr. L. Freeman (in Phytologist) as growing at Moseley in 1841.

A few years since, I had the pleasure of visiting Moseley and its pools, in company with my friend Mr. W. Mathews, jun., A M., F.G.S., for many years the active Honorary Secretary of our Club, and I then noticed *Drosera rotundifolia*, *Comarum palustre*, *Viola palustris*, *Parnassia palustris* (one plant only), and a considerable quantity of *Rubus suberectus* fringing the side of one of the pools, as well as *Equisetum sylvaticum*. I fear that most of the other bog plants that once found a domicile at Moseley must now be put down as wanting, and botanists must solace themselves, as Mr. Mathews says, "with the reflection that their place will be supplied by much more important and profitable vegetation." But if the distribution of native plants in our island is to be thoroughly understood, these banished species must not be forgotten; while the changes continually taking place in local floras from the extinction of native plants by cultivation, and the immigration of aliens through the introduction of foreign seeds, and in some instances perhaps by natural causes, forms one of the most interesting episodes in the science of botanical geography.

I must remark, however, that an intelligent gardener of Birmingham, Mr. H. Webb, from whom I have received several rare mosses, and among them *Tetraphis pellucida*, from the Lickey, informed me that *Osmunda regalis* yet grows in an obscure place by a pool within Mr. Taylor's plantations at Moseley. This fern may then hope to maintain its standing here, if in obscurity, for some time longer. Mr. W. Southall, jun., of Birmingham, Mr. Luxford, Mr. D. Cameron, and Mr. W. G. Perry (in Phytologist), record the *Osmunda* up to 1842.

In early spring the meadows about Kings Norton and Northfield are profusely decorated with Daffodils (*Narcissus pseudo-Narcissus*), while the Forget-me-Not (*Myosotis sylvatica*) and *Cardamine amara* are pretty common. In barren pastures about Bordesley, the Adder's Tongue (*Ophioglossum vulgatum*) is abundant. The Daffodil is also plentiful in the parish of Cradley, within "the Black Country," where plants of interest

become much reduced in number. It may be remarked that the Rev. J. H. Thompson reports *Ribes alpinum* as growing about Hales Owen (I presume as a relic of garden cultivation), and I have myself seen large bushes of it near Northfield, in an old hedge, not now bounding a garden. This shows, at any rate, that the plant might well grow in the north of Worcestershire from any chance that placed it there. South of Bromsgrove I have not seen it.

### YARDLEY.

This extreme north-eastern parish of Worcestershire, abutting upon smoky Birmingham, whose polypoid arms have spread into its once lonely fields and woods, seems formerly to have nourished many rare marsh plants, if a list was to be trusted that a highly valued medical friend, Dr. J. H. Blount, then residing in the midland metropolis, favoured me with a sight of, and which professed to be a catalogue of plants actually gathered there. The herbarium itself, however, was not accessible, and Yardley, from its proximity to Birmingham, has been so invaded and built upon of late years, that I should now be almost afraid to quote any uncommon plant from that list, unless seeing the herbarium to which it referred; and I have heard of nothing of importance recently gathered there.\* Having visited Moseley and Yardley in company with Dr. Blount in furtherance of botanical observations, it is scarcely possible to refer to those pleasant days of companionship, when we were both members of our newly formed Club, without a pang of regret that those bright days of Nature's inspiration have for ever passed away.

Beoley is another parish on the eastern verge of the county, not far from Redditch, which the Club in a body have never been able to reach, and I have as yet only a few plants to record as indigenous here on the observation of Mr. W. Mathews, jun.

\* In the list of plants "observed in the neighbourhood of Birmingham," by Mr. Samuel Freeman, and inserted in the *Phytologist* for 1842, *Campanula latifolia* is put down as growing at "Yardley Bridge;" but whether this fine bell-flower can now retain its position at Yardley, is, I think, more than dubious.

Among these is *Rosa spinossima*, by no means common in the Bromsgrove Lickey Division, and *Sanguisorba officinalis*. Probably other plants worth gathering might reward a careful explorer. I observed a very boggy wood between Redditch and Headless Cross, to which I was conducted by my friend Captain Bartleet, one of our members, and though this was too late in the season to realize any good plants, yet I think the locality is hopeful.

#### PLANTS OF THE STOUR VALLEY.

The country between Frankley and Halesowen is very uneven, and the tributaries of the Stour have in the course of time cut themselves deep ravines through the stiff clays of the Permian beds and Coal Measures. These ravines are fringed with thick woods, pleasant to wander through, such as the Twylands and Offmoor, and through the deep shades of the former the infant Stour may be traced for some distance as it takes its solitary though sportive course—

“ Amidst the hollows of the rocks its fall  
Makes melody, and in these woodlands deep  
The waters sparkle, and bright gleams betray  
Their windings to the day.”

MRS. HEMANS.

Other woods clothe the northern flanks of the Clents, and extend nearly to the village of Hagley, while the romantic height of Wichbury, nearer to Stourbridge, has the trenches of its ancient camp overgrown with dense thickets, among which solemn Yews of the growth of many centuries dominate, and spread out their aged arms over ravines immersed in a profundity of gloom. Here the parasitical *Lathræa squamaria* rejoices in congenial obscurity. In this part of the district the hedge banks are covered with the little green-flowered musky-scented *Adoxa moschatellina*, and the early blooming *Ranunculus auricomus*; while at a later period the field sides are bright with the Honeysuckle-clover (*Trifolium medium*), and the yellow *Genista tinctoria*. *Ranunculus arvensis* fills many of the corn-fields, and

in the pastures *Sanguisorba officinalis* and *Habenaria bifolia* are frequent, the latter plant being very uncommon if indeed ever present in any other part of Worcestershire. The brook sides are adorned with the elegant Water Avens (*Geum rivale*), varied here and there by the rarer *G. intermedium*, and the woods are full of the scented Woodruffe (*Asperula odorata*), the curious *Paris quadrifolia*, *Serratula tinctoria*, and the once honoured Sanicle. The noble broad-leaved Bell-flower (*Campanula latifolia*), adorns woody spots near Halesowen Abbey, and the beautiful Flowering Rush (*Butomus umbellatus*), and the Arrow-head (*Sagittaria sagittifolia*), grow in the canal at the Leasowes, near Halesowen. In marshy ground the elegant *Equisetum sylvaticum* is in several places most abundant. Of very uncommon plants, *Agrimonia odorata* has been noticed at Hunington, by Mr. W. Mathews, jun., *Mentha viridis* between Hagley and Halesowen, *Salix pentandra* near Frankley, and *Equisetum hyemale*, also at Frankley. Mr. Mathews also pointed out to me the Scaly Fern (*Ceterach officinarum*), located on the garden wall at the Leasowes—once the residence of Shenstone.

Offmoor Wood, lying between Hales Owen and the Clent Hills (some of its oaks being *Quercus intermedia*), is a locality that deserves to be visited by any local botanist, and Mr. Mathews and myself have several times explored it. We noticed *Myosotis caespitosa*, *Rosa inodora*, *Hieracium murorum*, and *Rhamnus Frangula* here, with various Rubi,\* the pretty Eyebright (*Euphrasia officinalis*), also *Bartsia Odontites*, plentiful, and the usual wood plants. *Asperula odorata* is abundant in all the woods hereabout, and *Galeobdolon luteum* of frequent occurrence. The Dales Wood, nearer to Romsley, is a thick covert, where Mr. Mathews believed that he had seen *Polypodium Dryopteris*, but after some search we failed to find it. This, however, may be a hint to any future explorer. The following

\* Among those marked forms well deserving notice may be mentioned *R. affinis*, *R. Lindleianus*, *R. leucostachys*, *R. amplificatus*, Lees, (*macrophyllus*, Bab.), *R. radula* (very rampant), *R. rudis*, and *R. tenui-armatus*, Lees, (*Balfourianus*, of Babington.)

Carices may be all found about Offmoor and Frankley Wood :—*Carex pallescens*, *C. binervis*, *C. muricata*, *C. sylvatica*, and *C. pendula*. *Carex pseudo-Cyperus* occurs in a little pond near Offmoor Wood.

About the vicinity of the ruins of Halesowen Abbey, which is fringed with “gray ruin’s golden crown,”—the Wall-flower (*Cheiranthus Cheiri*)—is good botanical ground, for the Abbey was situate in a sequestered spot, and *Cardamine amara*, *Rosa tomentosa*, *R. dumetorum*, *Hypericum dubium*, *Lactuca muralis*, and *Campanula latifolia* may be observed close to it.

On the banks of the infant Stour (which, pure and bright in its childhood, becomes dirty as a begrimed mendicant in its progress through Kidderminster,) especially at and near Illey Mill, the following plants are noticeable :—*Myosotis sylvatica*, *Geum rivale*, *Rhamnus catharticus*, *Dipsacus pilosus*, and *Pyrus torminalis*. The Stour may be followed up from Illey Mill into the Frankley Woods, where the scenery is very pleasing, the shallow stream being in places covered with a thick canopy of shade, where the gentle current laves the pebbles that are blackened by some encrusting lichen.

*Geranium lucidum* presents itself by the side of the road to Birmingham, near the Leasowes, and the common Wormwood (*Artemisia absinthium*,) grows in fields at Hunington, about Halesowen. The Adder’s Tongue (*Ophioglossum vulgatum*,) is rather plentiful in pastures about Offmoor.

### CLENT HILLS.

The Clent Hills, rising to a considerable height above the Severn Valley (Walton 900 ft., Clent proper 910 ft.),\* might be considered as likely to furnish a good variety of plants, but with the exception of the Foxglove (*Digitalis purpurea*), they are singularly barren of plants of interest, arising from the nature of the soil (a hard though stratified Permian Breccia),

\* Mr. Jukes puts down the height of the Clent Hills at 950 ft., “*South Staffordshire Coal Field*,” which is too much.

the absence of wood, and the deficiency of water. They thus produce no characteristic vegetation, and show no plant of any great rarity. Mr. A. Irvine, of Chelsea, who examined them some years since, thought the absence of the Water-cress (*Nasturtium officinale*,) was a peculiar feature, and has remarked upon this in the Phytologist. Little pools and springs are in fact few and far between in the country about the Clent Hills, but the Water-cress is to be found where they occur, as observed by Mr. W. Mathews, jun., and myself. Ferns may be considered as not very plentiful, except the too common Brake (*Pteris aquilina*).

The tops of the hills are covered with close turf, without any evident exposure of rock, and the grasses that occur are but of little interest, evincing the barren nature of the soil, such as *Poa rigida* and *Nardus stricta*. *Manchia erecta* is, however, plentiful, on the summit of Clent proper, as well as the little grass *Aira præcox*. Perhaps even the disappointed botanist may be solaced by the splendid view that here rises before the eye of the explorer, and which has been well described in Thomson's Seasons—

“The bursting prospect spreads immense around,  
Snatch'd over hill and dale, and wood, and lawn,  
And verdant field and darkening heath between;  
And villages embosom'd soft in trees,  
With spiry towns by surging columns mark'd  
Of household smoke; the eye excursive roams  
Wide-stretching from the hall:—  
To where the broken landscape, by degrees  
Ascending, roughens into rigid hills;  
O'er which the Cambrian mountains, like far clouds  
That skirt the blue horizon, dusky rise.”

One of the Clent eminences nearest Hagley Park is crowned with four large “rag-stones,” or masses of conglomerate, which, from their hoary aspect and ruggedness, have got to be called “Druids' Stones,” as if claiming an unknown antiquity; but in reality they are of modern manufacture, and, as stated by Mr. Timings,\* “were intended to point out the cardinal points;”—rather clumsily it may be said.

\* Timings' Guide to the Clent Hills.



It should be remarked that the eminences of Romsley, Walton, and Clent proper, collectively known as the Clent Hills, are not united in one ridge, but lie parallel to each other, with long vales of meadow land between; and the vale between Walton and Clent is the celebrated Clatterbatch, where the murdered corpse of the Saxon boy-king Kenelm was found in A.D. 819. Dry as the hills themselves are, the valleys between them are not without water, and at the southern base of Romsley Hill, below the Dales Wood, which occupies the western side of Romsley (chiefly hazels and birches), there is a pretty spot where a young stream falls over a ledge of rock amidst a dense thicket, in the marsh around which grow *Valeriana dioica*, *Chrysosplenium alternifolium*, the great Willow-herb (*Epilobium hirsutum*), &c. *Campanula latifolia* also grows near. In the valley between Romsley and Walton Hill are several wet places, abounding in *Polygonum bistorta*, and the Wood Horsetail (*Equisetum sylvaticum*). On the flat top of Romsley Hill, *Galeopsis versicolor* has been reported as plentiful, though probably not constant there. The rare *Equisetum hyemale* has been observed on the Day-house Farm, Romsley, and on Frankley Lower Hill Farm, by the acute eye of Mr. W. Mathews.

Whinwood Heath, adjoining Romsley, was a few years since a waste, covered with the autumnal Gorse (*Ulex Gallii*), and Brakes (*Pteris aquilina*), with here and there a tuft of *Carex pilularia*, and tinged on the ground with dark coloured Lichens, as rough and wild as any common left to Nature's keeping; but its scattered birch trees have been cut down, it has been enclosed, and if more valuable to the farmer, it has ceased to possess any interest to the botanist. *Lepigonium rubrum* used to adorn the barren heath here with its pink petals, and if any gravelly paths are left for pedestrians, there it may yet abide.

There is a ravine that has its origin at the east end of St. Kenelm's Chapel, where was formerly a hallowed spring sacred to the murdered Saxon Prince, whom the chapel commemorates, and though this is now dried up, and has disappeared like the

legend itself, yet a "wishing well," to some extent believed in by the lads and lasses of the lower order, yet remains. Hereabouts I have gathered *Chrysosplenium alternifolium*, and our late active member, Mr. G. E. Roberts (now lost to us), observed it also rather plentifully, at the same spot.

The rare *Carex fulva* occurs in some plenty in a marshy spot near St. Kenelm's, below the Spring Farm, and not far from the path to Offmoor.

I noticed the Mountain Ash (*Pyrus aucuparia*) in Frankley Wood, and the Yew (*Taxus baccata*) is here evidently indigenous, as it is in the west of Worcestershire, some fine old trees occurring on the skirts of Frankley Wood.

The *Colchicum autumnale* grows in meadows below St. Kenelm's, thus showing its indifference to all soils and every elevation, as far as Worcestershire is concerned, as well at home here as on the öolite at Broadway. Almost the same remark may be made as to the *Colchicum* in a European sense, being as frequent in the plains of the Po, in Italy, as the uplands of Germany.

## HAGLEY AND WICHBURY.

Hagley Park, the demesne of Lord Lyttelton, once famous for its classic beauties, and the resort of the poets of the last age, abuts upon the northern flank of the Clent Hills, and the Club has several times wandered through the embowered glades of the park under the guidance of the Hon. and Rev. W. H. Lyttelton, Rector of Hagley, who twice hospitably received us at the rectory under his presidency. But whatever classic fame remains to Hagley, its botanical interest is almost limited to the fine timber trees existing there, of which some lofty Oaks and two or three huge Limes are well worthy inspection. There is also a Cedar of very large dimensions and spread of bough, growing near a pool, which has taken its growth well. No very rare plant has ever been gathered in Hagley Park, that I am aware of, but in the autumnal season numerous Fungi decorate

its grassy slopes, and about the roots of some old trees I once gathered the rare *Polyporus frondosus*, which has been found nowhere else in Worcestershire. I have also noticed *Sphæria militaris* here. A large Fairy Ring, which bore on its circumference an abundant crop of *Agaricus giganteus*, was observed by Mr. W. Mathews, jun., two or three years ago, in front of Milton's Seat, and I believe yet exists. The delicious *Agaricus procerus* grows in the park, and I have also noticed *Cantharellus aurantiacus*, very fine, among the fir plantation near the Temple of Theseus.

Wichbury Hill, north of Hagley, is an interesting locality which the Club has several times explored, and where I had once a pleasant day with my friend, the Rev. J. Whiteley, Rector of Pedmore. The hill, which has upon it the vestiges of a Roman castrametation, is now covered by a dense wood, and thus shadowed, the ditches and vallum of the camp are made very impressive. The wood is very thick upon Wichbury, and on the sides of the outer vallum are many large and very fine Yew Trees, feathered by extending branches to the very ground, and some of these are so large, and evidently so old, that I should consider it probable that they have stood where they now appear for nearly, if not quite eight hundred years. The largest are about twenty feet in girth. Many Cherry Trees (*Prunus Avium*) of considerable size are scattered about the wood, and the Elder (*Sambucus nigra*) appears here as if almost in an indigenous state. The semi-parasitical Toothwort (*Lathræa squamaria*), always fond of shadowy gloom, grows in Wichbury Wood in some abundance, about the roots of old trees. Another plant attached to Wichbury, and pretty well dispersed through the county, though seldom anywhere abundant, is *Cardamine impatiens*.

Nearer to Stourbridge is a romantic spot called the Ham Dingle, where I have gathered *Epipactis latifolia* in a luxuriant state, and where also *Neottia Nidus-avis* has been found. The Lady Fern (*Athyrium Filix-fœmina*) grows here very tall and

graceful. A little rivulet, called the Swin, originating in Pedmore, flows through this dingle, and makes its way to Old Swinford, finally reaching the Stour. There was formerly a morass at Pedmore, where the Cranberry (*Vaccinium Oxyccocos*) and *Comarum palustre* had a location, but only a small pool remains, and the plants have now disappeared.

As a proof that the Bromsgrove Lickey Division deserves botanical separation from the Severn Valley, it is impossible for an observer not to be struck with the remarkable change in the vegetation which takes place at the village of Hagley, in travelling along the turnpike road from Birmingham to Kidderminster. It is at Hagley that the former division is left, the boundary between it and the Severn Valley Division being very nearly coincident with the great western fault of the Coal-measures, and the sandy country entered upon lying between Hagley and Kidderminster. The plants at once appear of a different character, and instead of those mentioned as adorning the uplands through which the sources of the Stour take their course, *Campanula patula*, *Turritis glabra*, with species of *Verbascum*, and other sand-loving plants, rise to view, not observable, or rarely so, in the district left behind.

#### CRADLEY.

The parish of Cradley lies east of Stourbridge, and comes so much within the shadows and smoke of "the Black Country," as to be almost out of the limits of botanical observation. Yet one of our most enthusiastic botanical members (the Rev. J. H. Thompson) is Incumbent of Cradley, and it might have been hoped that some of his favourite flowers would have found him out. But there is no resisting manufactures and smoke, and Flora retreats disgusted from the vicinity of iron works, and the dismalities that surround a nail-making population. I have asked my friend to furnish me with a record of the plants of his parish, but he can only give me the statistics of his day and night schools, for there are no plants, he says, worthy of notice to record. Even the Lichens, Mr. Thompson tells me, will not

grow upon the trees at Cradley, and their bark brings a lower price in consequence; nor has he ever been able to detect even an *Opegrapha*. All is blackness and ashes like the vicinity of a volcano, and the river Stour, that runs sullenly through the parish, has no flowers on its bank to tempt the stay of a poet for a single moment, and not a *strain*, save that of a creaking whimsey, has been heard there since the days when Shenstone tuned his rural lays at the once admired Leasowes. Yet, "time has been," and within legal memory too, when there was something of natural beauty within the bounds of Cradley, and the fire and smut issuing from furnaces and chimneys had not killed or contaminated all the floral loveliness of the country. Mr. W. Scott, who wrote a "History of Stourbridge," early in the present century, and gives a list of the plants in the neighbourhood, mentions "Cradley Park" as good botanical ground, and records the elegant *Pyrola media* as growing there. But Cradley Park has been long enclosed, and all its beauties destroyed. Only on the side of the parish towards Halesowen can a few relics of "days departed" be met with, and these, like *Solidago virgaurea*, *Lactuca muralis*, and *Dipsacus pilosus*, of little beauty or rarity. Overend Wood yet nourishes the wild Daffodil and Wood Anemone, and a few common plants, but even the ferns usually most general, are here by no means of frequent occurrence. I have had information from the Rev. J. H. Thompson that the Henbane (*Hyoscyamus niger*) has occasionally shown itself in Cradley churchyard, but without establishing itself there; and perhaps, more curious still, that foetid fungus *Phallus impudicus* has appeared in the same place. Lutley Holloway, between Cradley and Halesowen, is likely still, perhaps, to possess a few plants worth notice, being somewhat removed from smoky influences. Here *Hypericum Androsæmum* and *Lathræa squamaria* have been formerly observed, and possibly they may be detected there again. The little *Adoxa moschatellina* grows at "Two-gates," and on the banks of the Stour.

#### DUBIOUS OR ERADICATED PLANTS.

Mr. W. Scott, who was a correspondent of Purton's, (author

of the Midland Flora), in his work before mentioned (1832), has put down some plants in his list which have not been lately found at the spots mentioned; yet it is possible that some may either now exist in obscurity, or recur again, and botanists of the vicinity should institute a close search. With the view of inquiry I record those Scott has mentioned below:—

*Mentha pulegium*, banks of Pensnet Reservoir.  
*Littorella lacustris*, Pensnet Reservoir.  
*Limosella aquatica*, Pools near the Heath (Pedmore)?  
*Sambucus Ebulus*, Overend, Cradley.  
*Melittis melissophyllum*, Woods near Halesowen.  
*Marrubium vulgare*, Baldwin's Green, near Lye Waste.  
*Chlora perfoliata*, Wichbury, Cradley.  
*Populus alba* and *nigra*, banks of Stour.  
*Orchis latifolia*, Cradley Park.  
*Schoenus nigricans*, Pensnet.  
*Eleocharis acicularis*, Reservoirs.  
*Scirpus pauciflorus*, Reservoirs.  
*Scirpus setaceus*, Pedmore Common.  
*Carex paniculata*, Marshes near the Heath (Pedmore)?  
*C. teretiuscula*, banks of the Stour.  
*C. vesicaria*, Reservoir (Pensnet)?  
*Triticum junceum*, fields between Pedmore and Hagley.  
*Arundo calamagrostis*, Pensnet Reservoir.  
*Aira cristata*, commons.  
*Avena elatior*, grass fields.  
*Festuca myurus*, road sides.  
*Bromus secalinus*, woods.

Some of these may possibly have been overlooked, or may recur again, and it may be well for botanists resident near Stourbridge or Cradley to mark those yet remaining. I have not put down all the plants enumerated by Scott, as he may have made some mistakes of designation, but the above were likely to have been met with in his time, and some may yet remain. Mr. Scott is mentioned by Purton as a correspondent, so that if he sent specimens to Purton, which is likely, the evidence of that accurate botanist would be corroborative.

### THE DUDLEY COUNTRY.

The town of Dudley, and the country a short distance around it, chiefly on the south side, forms an isolated portion of Worcestershire, surrounded on all sides by Staffordshire; yet between it and Birmingham another peninsular portion of

Worcestershire intrudes into Staffordshire, while east of Birmingham, Yardley pushes into Warwickshire, so that county boundaries are here so uncertain, to field observation, that all the plants hereabout may be considered as common to Worcester, Stafford, and Warwick, with the one local exception of *Atropa Belladonna*. This isolated portion chiefly merits notice on account of its geological structure, the celebrated Dudley limestone nourishing, of course, plants interesting to the botanist, as well as enclosing fossils valuable to the geologist. The country here forms a portion of the great Staffordshire Coal Field, and to the north of the town of Dudley, the Silurian ("Wenlock") limestone rises up into various domes called the Castle Hill and Wren's Nest, which, with other smaller elevations, have been protruded beneath the surrounding coal strata. Eastward are the basaltic Rowley Hills that have been effused over the carboniferous beds, and form various bosses of columnar structure. Numerous botanists, as well as myself, have gathered and noted the plants here, which are nearly all of the species usually predominating on limestone or calcareous soil, of whatever age, and the indications of Dr. Ick, of Birmingham, and other observers, being rather vague,—such as "grounds near Dudley Castle," &c.—I shall consider the few plants worth naming as all on Worcestershire ground for my purpose. One plant only appears exceptional, which is the Deadly Nightshade (*Atropa Belladonna*), and this, though tenaciously maintaining its position, notwithstanding the attacks of so many botanists from Birmingham and other places, may yet really owe its introduction at this locality to its escape from the garden of the monks at Dudley Priory. Except as once noted on a wall at Lincomb, near Hartlebury, I have no other indication of it in Worcestershire.\* The following plants fond of a limestone location, may be added to the *Belladonna* :—

\* *Atropa Belladonna* is recorded as growing at Dudley Castle by Drs. Withering and Stokes, in 1787; Mr. Rufford (in Purton's Midland Flora) gathered it there in 1815; Dr. Ick, of Birmingham, in 1836; Mr. Mathews and myself some years subsequently; and my friend Dr. Fraser, of Wolverhampton, observed it there plentifully in 1865.

*Reseda lutea*  
*Rosa rubiginosa*  
*Inula Conyza*  
*Carduus Eriophorus*  
*Picris hieracioides*  
*Helminthia echinoides*

*Erigeron acris*  
*Campanula glomerata*  
*Chlora perfoliata*  
*Gentiana Amarella*  
*Echium vulgare*  
*Linaria Cymbalaria*

The *Linaria* is an intruder, and perhaps purposely introduced, as Dr. Booker planted ivy at the base of the keep of the castle, where in the black country it was rather out of character, and has not grown kindly. But Nature clothes old walls irrespective of the efforts of man, and the *Echium vulgare* had probably migrated hither long before, flourishing, it may be said, much more in the north of Worcestershire than the south. According to the opening of quarries and the debris scattered about, so will plants shift their localities and rove about; and where counties intermingle much with each other, as they do around Dudley, comital lines will not be regarded by them, and the botanist need not much attend to them either.

As Mr. Jukes observes in his account of the "South Staffordshire Coal-field," in the Geological Survey, "from Frankley Beeches the water-shed runs through Rowley, Dudley, and Sedgley, to Wolverhampton. On the west of that ridge the streams run either directly into the Stour, or into the Smester Brook, which, rising just west of Wolverhampton, runs nearly due south to join the Stour near Stourbridge." The limestone hills that give a feature to the country near Dudley are four, the Castle Hill itself, Hurst Hill, the Wren's Nest, and Sedgley Beacon. According to Jukes, the height of the Castle Hill is 730 ft., and Sedgley Beacon 760 ft. Though these eminences are within Staffordshire, they cannot be left out of consideration in noticing the Dudley country and its plants.

The Rowley basaltic hills, that strike in a south-east direction from Dudley through a portion of Staffordshire into the parish of Halesowen, where they terminate, and which, according to Jukes, ascend to 820 ft. at the highest point, scarcely come within cognizance, as far as comital bounds are to be observed, though the two hills of the group nearest to Dudley—Cawney



and Tansley, both of which have quarries of the basalt—are in Worcestershire. Plants are not very partial to the basalt, and nothing rarer than *Cardamine impatiens*, *Campanula Trachelium*, *Geranium lucidum*, and *Ophioglossum vulgatum*, has come under my observation, though I have explored the hills both with Professor Buckman and the Rev. J. H. Thompson. In one place, indeed, a curious dwarf growth of *Rubus scaber*, which had there a very distinct aspect, attracted my attention.

### COMPARISON OF BOTANICAL DIVISIONS.

With respect to favourable places for botanical research, every thing depends upon soil, situation, and the more or less abundance of water, whether as springs, ponds, or running streams; for the more diversified a country is within a given distance, the greater will be the number of species growing there; and a large area in which the soil is of similar character, will produce fewer plants than a smaller one where the conditions are varied. Thus, in comparing the districts into which I have divided Worcestershire, the Malvern and Teme Division (which takes in the entire western part of the county as bounded by the rivers Teme and Severn, and including the Malvern Hills), would seem likely from its variety of hill, dale, river side, and ancient forest ground, to contain a greater number of species than any other division, yet this is not the case. The number of phanerogamous species in this division amount to 785. But by enlarging the area to the whole county, 148 more species are obtained from the three other divisions, and the entire Flora of Worcestershire, including naturalized (*not* cultivated) plants, is then shown to amount to 933 species. This is, however, less than the number that Mr. Watson assigns to Mid Britain, which is 1,148, while the total Flora of Britain is put down at 1,425. The 148 species that are absent from the Malvern division are thus distributed:—

SEVERN VALLEY.	BROMSGROVE LICKY.	AVON.
106	13	29

But 4 of the Avon species occur also in the Bromsgrove Lickey Division.

The plants in the Bromsgrove Lickey Division are entirely made up of species which, like the Cranberry and *Hypericum elodes*, are exclusively attached to boggy places, the bogs having been formerly more extensive in the northern part of the county than the south, and remaining undrained to a later period.

But notwithstanding the varied nature of the Malvern Division, it has only thirty-four species that are unknown in the other portions of the county. These are :—

<i>Ranunculus hirsutus</i>	<i>Erythræa pulchella</i>
<i>Helleborus foetidus</i>	<i>Cynoglossum montanum</i>
<i>Aconitum Napellus</i>	<i>Mentha sativa</i>
<i>Lepidium Draba</i>	<i>Orobanchë elatior</i>
<i>Sagina nodosa</i>	<i>Pinguicula vulgaris</i>
<i>Lathyrus palustris</i>	<i>Utricularia vulgaris</i>
<i>Potentilla verna</i>	<i>Centunculus minimus</i>
<i>Potentilla procumbens</i>	<i>Polygonum minus</i>
<i>Rosa sepium</i>	<i>Salix acuminata</i>
<i>Epilobium roseum</i>	<i>Ophrys muscifera</i>
<i>Myrrhis odorata</i>	<i>Epipogon aphyllum</i>
<i>Myriophyllum alterniflorum</i>	<i>Gagea lutea</i>
<i>Sedum album</i>	<i>Juncus obtusiflorus</i>
<i>Valerianella eriocarpa</i>	<i>Potamogeton prælongus</i>
<i>Lactuca Scariola</i>	<i>Eriophorum gracile</i>
<i>Pulicaria vulgaris</i>	<i>Hordeum sylvaticum</i>
<i>Campanula Rapunculus</i>	<i>Lolium temulentum</i>

Perhaps even of the above several are naturalized plants, and not truly indigenous productions.

Even then in this division comprehending the Malvern Hills, considered by geologists as uplifted from the sea "countless ages" ago, the Flora is almost entirely derivative, and there is scarcely anything of a distinctive character, for out of the 34 species not found in the other divisions, perhaps only *Ranunculus hirsutus*, *Pinguicula vulgaris*, *Utricularia vulgaris*, *Cynoglossum sylvaticum*, *Anagallis tenella*, *Polygonum minus*, *Sedum album*, *Potentilla verna*, *Lathyrus palustris*, *Pulicaria vulgaris*, *Myriophyllum alterniflorum*, *Gagea lutea*, *Juncus obtusiflorus*, *Ophrys muscifera*, and *Hordeum sylvaticum*, can be considered truly endemic, and these are all found in other parts of Britain. If, indeed, the ancient Malvern ridges were traversed from end to end, they would only produce three plants, *Sagina nodosa*,

*Sedum album*, and *Potentilla verna*, that are not to be found in other parts of the county.

The Severn Valley includes more plants entirely its own than any other division of Worcestershire, and the plants of a square mile taken from the river side and including a portion of forest ground, would strangely contrast with the small amount of species on the barren clays between Bromsgrove Lickey and Birmingham. This shows how variety of soil within a given area must influence the distribution of plants. Within Wyre Forest we may consider Nature as reigning supreme as long as the forest has had existence, and this must carry us a long way back into the mist of years; so that most of the forest plants previously enumerated may be considered truly indigenous to the soil. No botanist would waste a doubt upon such plants as *Thalictrum minus*, *Pyrola media* and *minor*, *Gentiana campestris*, *Geranium sylvaticum*, *Rubus saxatilis*, *Cephalanthera ensifolia*, *Spiranthes æstivalis*, *Eriophorum latifolium*, or *Melica nutans*. These, though truly wild in the forest, do not occur at present in any of the other botanical divisions. Nor, of course, could any but Nature's hand have given the Oaks, Mountain Ashes, Yews, Limes, Buckthorns, &c., that cover the forest ground. Nevertheless, a trace of man's former occupation was apparent in the old Sorb-tree (*Pyrus domestica*), long set down as native, and in a *Prunus domestica* not far away from it. A few other plants like *Antennaria margaritacea* have furtively crept into fugitive or permanent occupation.

I have before remarked on the plants whose fondness for a saline nutriment have determined their location by the side of the salt-water Droitwich Canal\*; and there are other species that confined to the southern portion of the Severn Valley, may possibly show how much farther the tidal wave of the estuary of the Severn intruded formerly inland than it does at present. Thus *Œnanthe pimpinelloides*, mostly fond of a

\* I have seen *Erodium maritimum* extending itself as a weed in the garden of my late esteemed friend, Mr. R. Smith, of Westacre, Droitwich.

littoral position, is plentiful in meadows at Forthampton and Powick, but does not extend itself north of Worcester; and *Æ. Lachenalii* inhabits the Welland and Longdon marshes. In the latter place (once doubtless a back-water of the Severn estuary) *Scirpus maritimus* lines the ditches in considerable quantities, and *Rumex maritimus* is found at times in a luxuriant state.

On the red marl cliff at the Mythe, near Tewkesbury, an extensive growth of *Isatis tinctoria*, subsisting time out of mind near the old tumulus once dedicated to the British deity Teutates, leads the imagination back to the days of the painted Britons; and what else but very ancient occupation indeed could have located *Smyrnum olusatrum* at the same spot? So Sarn Hill, Bushley, on the opposite side of the river, shows veritable thickets of *Iris fetidissima*, due perhaps to its former maritime exposure. The occurrence of *Gastridium lendigerum* indicates the same thing.

The Avon and Lias Division, which impinges on the Oölite of Gloucestershire, possesses 24 plants not found in the other districts. Some of these are local plants, as the *Acorus Calamus*, growing on the banks of the Avon, and *Villarsia nymphaeoides*, only known in one place near Eckington, on the still waters of the Avon, on the side of which the great Water-Dock (*Rumex hydrolopathum*) shows its long leaves, and islets of the tall *Scirpus lacustris* almost block up the stream. The Lesser Dodder (*Cuscuta Epithymum*) has only been met with on the Cracombe Hills, near Evesham; and *Geranium rotundifolium* is almost equally local. Bredon Hill, whose summit is oölite, produces *Astragalus hypoglottis*, the Horseshoe Vetch (*Hippocrepis comosa*), and the little Quinancy-wort (*Asperula cynanchica*), all unknown in other parts of the county, but truly endemic there. The product of Alderminster and its vicinity of lias limestone I have adverted to before. On the Cracombe Hills of shivery lias, the Rev. A. Winnington-Ingram showed me some bushes of Juniper (*Juniperus communis*) which, from

being remorselessly cut down, has become almost extinct in the county.\*

Bromsgrove Lickey Division, on its high ground, is the heathy part of Worcestershire, once desolate and waste, with an enormous growth of *Calluna*, *Erica*, and *Vaccinium*, and possessing the Cranberry and other bog-plants now all but extinct, for the bogs are mostly drained, and the hills cultivated, except on their very tops, or where the Windsor family owners of the soil have enclosed it, and planted firs and larches for the preservation of game. A few of the bog plants yet linger, as *Viola palustris*, *Parnassia palustris*, and *Equisetum sylvaticum*, the two former scarcely now to be found in any other portion of Worcestershire. On heathy spots yet remaining, *Juncus squarrosus* is predominant, as well as a *Rubus* (*R. scaber*, W. and N.), hardly known except in this division, where it is especially conspicuous. Unless where some little brook creeps along from the recesses of the gloomy Lickey, the meadows are very bare of the usual flowers of pastures, but where exposed as towards Bordesley and Tardebigg, they exhibit, as was noted by the Club on one of their excursions in this direction (in 1858), a most abundant growth of the Adder's-tongue (*Ophioglossum vulgatum*). The same pastures produced the Moonwort (*Botrychium Lunaria*), though sparingly. The latter has become rare in the county.

The northern extension of Worcestershire in the country about Dudley, where the Silurian limestone dominates above the great South Staffordshire Coal-field, proves decidedly the influence of calcareous strata upon the location of plants, and this has been noted by many continental botanists, as by Wahlenberg, in Sweden, and on the Carpathian Mountains; by Zuccarini and Sieber, upon the south side of the Alps; and by Unger in the Western Tyrol. Unquestionably, particular plants are attendant upon limestone, though it does not appear to make

\* Leland, the antiquary, who made his well-known Itinerary in the reign of Henry VIII., mentions the Juniper as covering Towbury Hill Camp, near Ripple, in the Severn Valley, but not a stray individual bush now remains there.

any difference as to the kind of limestone, or its geological age. *Anthyllis vulneraria*, *Chlora perfoliata*, and *Gentiana amarella*, are pretty generally tenants of a limestone soil, and they are equally so at Dudley and on the western side of the Malvern Hills on the Silurian formation. So *Carduus Eriophorus* is at home as much on the oölitic stone of Bredon as on the rocks about Dudley Castle, and the same may be said of *Campanula glomerata*. Ploughman's Spikenard (*Conyza squarrosa*) extends itself indeed even upon hard marl where there can be little calcareous matter, but still revels most luxuriantly where limestone presents itself. In like manner *Ophrys apifera* and *Orchis pyramidalis* prefer to grow on a limestone soil, and I have seen them flourishing both on carboniferous, lias, and Silurian limestone. *Pyrus Aria* and *Viburnum lantana* are also attached to limestone rocks, and the latter especially almost invariably indicates calcareous ground, though it matters not whether it be Silurian, Lias, or Oölite.

The changes made by cultivation and extended drainage must tend to eradicate many delicate native plants, and a few have accordingly quite disappeared from our local Flora, and more will probably follow, though lurking in neglected spots as long as they can maintain existence. Thus *Hypericum elodes* and *Parnassia palustris* have been banished, and *Ranunculus lingua* only remains in one locality within the county to my knowledge. But Nature balances the account in some degree by letting in stranger plants through man's involuntary agency, as probably was ever the case since the earliest wanderings of mankind. At first sight the common Nettle (*Urtica dioica*) might be considered a true native, but when it is seen to follow the footsteps of man with such dogged pertinacity, it then seems probable enough that it is as much an intruder as the *Anacharis* or *Udora Canadensis*, that has spread so much over Britain within the last few years. The Malvern Commissioners, who govern that newly constituted town, have abstracted the water from the hills above Great Malvern to supply a reservoir, and the little rills, instead

of sparkling along the stones on the surface, now flow in underground channels purposely constructed. But in the once undesecrated "Winding Valley" between the Worcestershire Beacon and the North Hill, the track of the subterranean water-course is marked by a line of Nettles that seem to have sprung up in the footsteps of the workmen, and show where their polluting influence extended. So in fallow fields *Veronica Buxbaumii* has wonderfully multiplied in the present day, as Chickweed or Choakweed (*Stellaria media*) has done in former times. Perhaps even the common Groundsel may not have been always so universal as it now is, and certainly agricultural weeds are upon the increase, in spite of the treatises written to destroy them. On this account there must be ever a variable number of plants in our Flora, as some perish, and others obtrude themselves on our attention. It is generally admitted that the little wall climber *Linaria Cymbalaria*, was an importation from Italy, yet it has now reached walls in the most secluded places, and must be acknowledged as truly naturalized at any rate. Plants of more modern introduction show a similar tendency to spread around, and I have seen the *Ribes sanguinea* growing as a seedling on walls at Malvern, and even noticed it in secluded lanes near Bromsgrove Lickey. Thus vegetation alters, and new plants take the place of the old. In this way the Flora of a country may be altered by immigration, without any new creation or supposed changes of climate. Indeed, such has been the case with regard to the thistleries of Buenos Ayres in South America, that now cover vast tracks of country, and the Floras of Australia and New Zealand will also in time be much modified. The United States of America have received an enormous amount of European weeds which they will never get rid of, and these keep extending themselves till they get far inland. My friend, Professor Buckman, informed me that he had met with our common Mustard (*Sinapis nigra*), growing most luxuriantly amidst the forests of Ohio, no doubt brought there by squatters. So former wandering peoples have brought

to Britain, in the ages back, various Poppies, Fumitories, Darnels, Docks, and other "Furrow-weeds of our sustaining corn." Change and exchange has been ever going on in this way between one country and another assuredly since man first commenced his wanderings over the earth, and the process will be continued to the end of time.

To the 947 species of Phanerogamous plants now growing in Worcestershire, the Ferns, Horsetails, and Lycopodia are to be added, for it was no part of this essay to go farther into Cryptogamic Vegetation. Six species of Equiseta are native to the county, and two only are at all local, *E. sylvaticum* and *E. hyemale*. The former is abundant in many places in the northern part of the county, but the latter is rare, and neither have been met with in the Avon Division. Of the Ferns, 21 species are indigenous to Worcestershire, and most of them of general occurrence, as the detailed list of plants will show. The Parsley Fern (*Allosorus crispus*), I have only found in one spot upon the Malvern Hills, and *Polypodium Dryopteris* only occurs in a few places, of which the Worcestershire Beacon, at Malvern, is one. *Cystopteris fragilis* is also uncommon, not growing on the dry Malvern Hills, but is found in the moister Bromsgrove Lickey country, and on the oölitic precipice of Bredon. *Lastrea Oreopteris* is not very uncommon, but *L. Thelypteris* has not been gathered within our limits. *Ceterach officinarum* only occurs scantily in the county here and there, while *Asplenium viride* once seated upon Ham Bridge, on the river Teme, is now entirely lost by the taking down of the bridge. *Osmunda regalis* yet exists by pools near Kidderminster, which is as much as can be said for its position in the county, for where it once grew at Moseley it has not been now noticed for many years. *Botrychium Lunaria* and *Ophioglossum vulgatum*, are all the "fern allies" that the county can boast; and with regard to the *Characeæ*, we can but certainly name four species: *C. flexilis*, *C. vulgaris*, *C. hispida*, and *C. fragilis*. If the above 37 Cryptogams are added to the 947 Phanerogamous plants, it gives nearly 1,000 species for



the Flora of Worcestershire here taken cognizance of. I have shown in my "Botany of the Malvern Hills" that the Phanerogamic Vegetation is there exceeded by the Cryptogamic, moderate as the height of the Malvern chain is; and a similar result could be shown if the whole county of Worcester, with its other various hilly woods about the Lickey, and the Forest of Wyre, was also taken into consideration. In a flat country devoid of rocks nourishing Lichens and Mosses, the Phanerogamic vegetation might preponderate, and it would also in a district but little intersected by brooks or rivers.

In the tabulated list of plants I have only set down five species of Rubi, as many botanists will not allow specific rank to the many forms of Fruticose Brambles that have been enumerated by the German botanists Weihe and Nees, who have been followed by Dr. Lindley, Mr. Leighton, Dr. Bell Salter, Professor Babington, Mr. Bloxam, and I may say myself also.\* Nevertheless, although Mr. Bentham, who has cut down so many previously acknowledged species in his Handbook, disallows these named forms, I am of opinion that many of them are as distinct as admitted species of *Hypericum*; and botanists object to a Rubus, who will readily segregate *Ranunculi* or give names to divided Cudweeds. It is no doubt possible to go too far, and the *via media* is the best course to take. In my "Botany of the Malvern Hills," I have described 28 species of Rubi, exclusive of *R. suberectus*, *R. cæsius*, and *R. Idæus*, and to these *R. Sprengelii* and *R. pyramidalis* (Bab.) might be added, not found in the Malvern Division. In general the *Rubi* delight in hilly spots of moderate height, becoming prostrate in this island above 2,000 feet of elevation, but descending and luxuriating even on the sands of the sea-shore. To combine them all as *R. fruticosus*, appears to me a reversal of the botanical principle of correct discrimination.

\* Dr. Steele, of Dublin, requested me to arrange the British Rubi for his "Hand-book of Field Botany" (published at Dublin in 1847), and I should now have but little alteration to make from that enumeration. Yet it must be admitted that some forms are more constant in their characters than others.

Besides the various localities of Worcestershire plants distinctly pointed out to the observer in this essay, every wandering botanist who looks carefully over the country will be able to find other spots where interesting plants grow to which perhaps no observer but himself has before penetrated, and where he may have difficulty to penetrate again. Thus the localities of plants are always varying, and an observer is not to be branded with deception because another person may not be able to find a species growing at the spot previously indicated. What has been certainly gathered in one year at a particular place may be never seen at that place again in a lifetime, for it must be particularly noted that plants are always *trying to extend their bounds*, and circumstances favourable to their development one year may not occur again for many seasons. Still a similar soil and exposure will in general produce the plants known under those circumstances; and thus it is that the numerous railway embankments and cuttings carried on to such an extent during the last twenty years, have produced little or nothing in the way of novelties or curiosities. This seems to show that seeds of any great age are not preserved in vitality beneath the soil. Bromsgrove, believed to owe its name to the abundance of broom growing about the country, has at any rate shown the propriety of the name by the quantities of broom that have sprung up and covered the sides of the cutting through the Lickey. So in other cases the common plants of the country appear on the sides of railway cuttings in great plenty and luxuriance, while the occurrence of anything strange—anything indeed beyond a stray garden flower for one or two seasons—is rare indeed. Of course bogs and watery places will retain their aquatic plants as long as water remains to them, and with the drainage of the bogs or the stopping up of pools, the plants must perish that could only grow where water existed for their nourishment. But even in a closely cultivated and well drained country like Worcestershire, as long as woods, coppices, hedges, ditches, and ponds are suffered to exist, so long will there be scope for the efforts and even discoveries of the excursive botanist; and

though he may often have to deplore the enclosure of a common, the diversion of a stream, or the drainage of a marsh, which has routed out the favourite objects of his study, yet he will unexpectedly come upon other places where they still remain to fight the battle of life. So have I found it, and though in the course of forty years observation I have lost many plants from loved localities, I have often re-found them at other spots, or again at the old ones after a lapse of years, and all the efforts of modern agriculture have scarcely banished more than would have been lost in the ordinary events of Nature. Changes, however, do occur both in the course of Nature, and by the transforming efforts of man, and it is the business of the philosophical observer to notice these changes carefully and record them. It is sad to mention the destruction by fire, wantonly applied, of the old Sorb Tree (*Pyrus domestica*) of Wyre Forest, in 1862, which removes one old honoured plant from the Worcestershire list, whether truly of natural origin or not; but Nature removes also other rare species, which, like *Spiranthes aestivalis* and *Epipogium aphyllum*, appear only one season, and can never be again detected.

Plants thus unaccountably presenting themselves at a locality *once only*, can scarcely be considered as belonging to the Flora of a country, even if the occurrence was entirely a natural one. Several plants, as *Vella annua*, gathered once on Salisbury plain, *Swertia perennis*, said to have been formerly found in Wales, and some others, have been placed in the British Flora, and for a time taken rank as natives, till, as no botanist could find them in the present day, some error has been supposed. But except in the case of a very critical species, where a mistake may have arisen, the plants were probably once gathered as declared, and they never again re-appeared. Such has been the case with the little orchid *Epipogium aphyllum*, which has been only *once found*, and probably will never again appear at the spot. Several analogous instances have fallen under my notice, and *Genista pilosa*, which the late Mr. Borrer put down as gathered by himself, on the common near Malvern Wells, has never been since observed

there by any botanist. Thus rare plants may for a short time only, grow at a spot, and then entirely disappear.

#### CONCLUSION.

I have thus placed before the Club some of the most remarkable facts that have come under my notice relative to the local distribution of the indigenous vegetation of Worcestershire, and the rare plants yet remaining in our confines. The observation of various members during the years of our existence has not been without good results, and I think that we have made some interesting discoveries, and done something to erase past errors. It should ever be borne in mind by the botanist that nothing should be left to after recollection or the fancies of mere vision ; but collected specimens should be named and ticketed *as soon as possible after gathering*, and preserved carefully for reference, especially in the case of rare or "critical" plants. Too many mistakes have crept into our Floras from errors of report, and the puerile desire of young botanists to find something "very rare," instead of diligently remarking things however common, which may be equally worthy of observation. This enthusiasm in time corrects itself indeed, and the mature student who, as a neophyte, looked only for something "scarce," finds at length that in the commonest things there is no scarcity of beauty or want of beneficence, and that structural skill and curious organization merits as much attention in humble, common, or obscure forms, as in the rarest or most beautiful production. Thus, as one of our poetical observers of little every-day things, found thoughts too deep for tears in the "meanest flower that blows," so the botanist admits that the humblest or most despised "weed" of the vulgar, has to him a host of hidden charms when awakened by his Ithuriel-like touch. The very mould on Time's fingers, and the dust on his robe, reveals secrets of organization when placed under the microscope ; and even with the naked eye to see how the warm mists of Autumn call up the coloured fungoid

tribes as if by enchantment, and polyform gelatinous masses into almost miraculous life, cannot be witnessed without admiration.

There will be always some persons to smile at the prying pursuits of the naturalist among things often so minute that they seem unworthy of regard, as if the little was not frequently more beautiful than the great. To such persons who may ask us what is the good of our wanderings and our studies, we must turn from the structural to the moral—from what they cannot appreciate in detail to what they can better understand in the mass. The mere spectator looks only to the grand picture before him, but the thoughtful artist studies its parts separately, as well as in combination. So the naturalist enjoys the moral and poetical beauties that come before his gaze in the landscape equally with the general observer who seeks instruction from Nature's beauties :—

“Cliffs, mountains, rivers, seasons, times,  
Let all remind the soul of heaven ;  
Our slack devotion needs them all ;  
And Faith—so oft of sense the thrall,  
While she, *by aid of Nature*, climbs,  
May hope to be forgiven.”\*

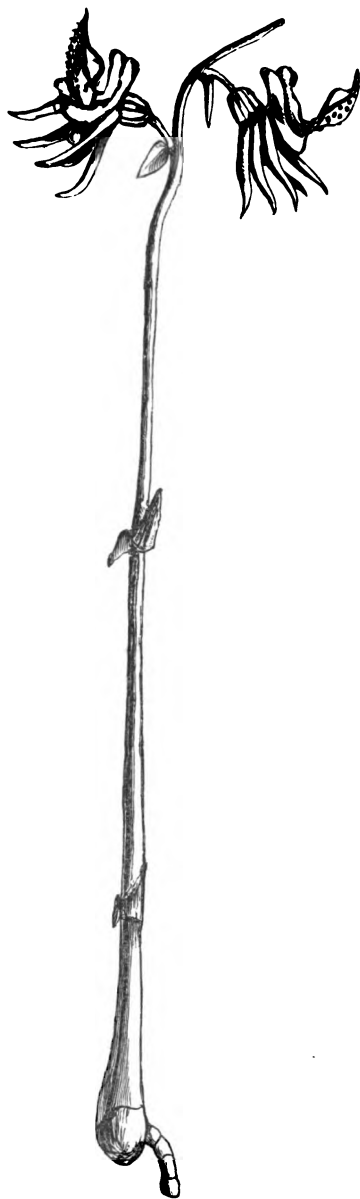
But the observant Naturalist goes beyond the grand features of Nature, for he *sees into them*, he follows them into their minutest divisions and details ; their plants and their inhabitants come into his view as worlds within worlds, and to him a thousand lesser pictures, all tinged with the hues of wisdom and devotion, enable him perhaps to climb, “by aid of Nature,” higher than those who condemn his pursuits, which, as they are beautiful and interesting at all seasons, can never fail both to please and to instruct.

But returning to the more particular subject of this essay, I would remark to my brother members that our observations in native botany are by no means fully complete, since many retired portions of the county have not been examined with that minuteness or attention that is desirable, so that the tabulated list of our plants arranged in four divisions, has still some hiata that

\* Wordsworth.

are required to be filled up by careful research. Old observations are apt to be discredited as made by botanists whose merits are forgotten, and when a collector has found anything uncommon he had better not keep it to himself, or some carping critic will intimate that confirmation of his discovery is desirable. Our labours, however, as far as they go, will be a valuable contribution to local botany, and being testified by various observers cannot be gainsayed by any reasonable men.

The wonders of the Cryptogamic tribes will still offer an almost unbounded scope for study to those whose time and opportunities may allow for observation in so extensive a field. As far as the Malvern Hills are concerned, I have not been idle in the collection of *Mosses*, *Lichens*, *Algæ*, and *Fungi*, yet every year something new or unnoticed before presents itself, and it would almost seem in these lower tribes, especially if the microscope be used, that Creative Power is still awake and active. At any rate new revelations of intricate structure are being constantly made, and in this direction there seems no bound to discovery. Here the botanist has novel wonders ever before him, and will agree with Lord Bacon, that "Knowledge is a rich storehouse for the glory of the Creator, and the relief of man's estate." An observer, like Linnæus himself, may be at last compelled to pause in his labours from fatigue or infirmity, but it will never be because he has exhausted the objects of his study.



**YELLOW-FLOWERED LEAFLESS ORCHIS. EPIOGIUM APHYLLUM, GMELIN.**

*Satyrium Epiogium*, LINN.

Stem, 3-7 inches high, sheathed, bearing a few scales, but without leaves. Flowers few, yellowish, the sepals and petals narrowly lanceolate, acute, the middle lobe of the lip ovate, furrowed, white, with four rows of purple tubercles, Spur very thick, appendage triangular. (From a specimen gathered in a copse close to Sapey Brook, Tedstone-de-la-Mere, Herefordshire, but only a short distance from Upper Sapey, Worcestershire, 1854.)

THE  
PLANTS OF WORCESTERSHIRE,  
ARRANGED  
ACCORDING TO THEIR OCCURRENCE  
IN THE  
FOUR DIVISIONS  
OF  
*The Avon, The Severn,  
Malvern and Teme, and Bromsgrove Lickey ;*  
PRESENTING IN COMBINATION  
THE ENTIRE  
FLORA OF THE COUNTY.

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*The order and names of Plants are arranged in general accordance with the Manual of Professor Babington, a few slight alterations and additions being introduced.*

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The statement of localities of Plants in Worcestershire here given, and their comparative frequency or rarity, is the result of observations made by Members of the Worcestershire Naturalists' Club through many years, and has undergone the careful revision of the following Members :—EDWIN LEES, F.L.S., Vice-President; WM. MATHEWS, Jun., A.M., F.G.S.; the REV. J. H. THOMPSON, B.A., Incumbent of Cradley; THOS. BAXTER, F.G.S., Second Master of the Cathedral School; and THOMAS WESTCOMBE, Worcester.



## EXPLANATION OF ABBREVIATIONS AND MARKS IN THE TABULATED LIST OF PLANTS.

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- gen.        signifies of universal occurrence in the division.
- plent.     denotes plentiful at many spots.
- ab.        is abundant at a few favoured localities.
- var. loc. shows that the plant occurs at various places, and is not confined to a particular soil.
- sev. pl.   implies several places *more than four* at which the plant has been gathered; when figures are given, 1 to 4 localities only are *certainly known*.
- m. pl.    indicates many places where the plant has been observed.
- n. c.      shows the plant to be not common in the division, though by no means rare, and variable in its numbers and appearance.
- n. u.      signifies not uncommon, though neither abundant or general.
- r. u.      is rather uncommon in the division.
- v. u.      denotes *very uncommon* to present observation, and rare.
- occ.       means occurring occasionally, and at irregular times and uncertain places.
- ar.        shows the plant to be limited to arable and cultivated ground.
- calc.      is confined to calcareous soil.
- riv.       means entirely confined to streams.
- pl.        denotes certainly planted, and not indigenous.
- s.         after a numeral is suggestive of a suspicion as to the plant's spontaneity at the spot.

The \* is placed to show that though the plant has been recorded as growing at a particular spot within the division, it is now lost.

The † prefixed indicates certain introduction by human agency, though now naturalized. The name of the plant *in italics* intimates colonization, though by natural means. A note of interrogation (?) implies that it is not absolutely *certain* that the plant is correctly designated.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
CLEMATIS Vitalba .....	calc.	var. loc.	plent.	...
THALICTRUM alpinum.....	...	...	...	...
flexuosum .....	...	...	...	...
minus .....	...	1	...	...
Kochii .....	...	...	...	...
flavum .....	n. c.	n. u.	n. c.	1
ANEMONE pulsatilla .....	1	...	...	...
nemorosa .....	gen.	gen.	gen.	plent.
appennina .....	...	1†	...	...
†ADONIS autumnalis .....	...	...	1*	...
MYOSURUS minimus .....	...	2	2	...
RANUNCULUS aquatilis .....	plent.	riv. n. u.	plent.	riv. n. u.
<i>(inclusive of most of the varieties recently described and proposed as species)</i>				
circinatus .....	v. u.	r. u.	r. u.	r. u.
fluitans .....	riv.	riv. ab.	riv.	...
hederaceus .....	n. u.	n. c.	n. u.	n. u.
cœnosus .....	...	...	...	1
flammula .....	gen.	gen.	gen.	gen.
Lingua .....	1	...	1*	...
Ficaria .....	gen.	gen.	gen.	gen.
auricomus .....	r. u.	m. pl.	m. pl.	n. u.
acris .....	gen.	gen.	gen.	gen.
repens .....	gen.	gen.	gen.	gen.
bulbosus .....	gen.	gen.	gen.	gen.
hirsutus .....	...	...	1	...
sceleratus.....	ab.	ab.	ab.	n. u.
arvensis .....	ar. gen.	ar. gen.	ar. gen.	ar. gen.
parviflorus .....	1	m. pl.	m. pl.	r. u.
CALTHA palustris.....	gen.	gen.	gen.	gen.
TELLIUS europæus .....	...	...	...	...
†ERANTHUS hyemalis .....	occ.	occ.	occ.	occ.
HELLEBORUS viridis .....	...	1*	2	1
foetidus .....	...	...	3	1*
AQUILEGIA vulgaris .....	...	sev. pl.	m. pl.	1
DELPHINIUM Consolida .....	1*	2*	2*	1 ab.*
ACONITUM Napellus .....	...	...	2	...
ACTEA spicata .....	...	...	...	...
PEONIA corallina .....	...	...	...	...
BERBERIS vulgaris .....	...	v. u.	1	...
†EPIMEDIUM alpinum .....	...	1*	...	...
NYMPHÆA alba .....	1 s.	2†	2†	2†
NUPHAR lutea .....	riv.	n. u.	n. c.	n. c.
PAPAYER Argemone .....	sev. pl.	sev. pl.	sev. pl.	r. u.
hybridum.....	...	1 ar.	...	...
Rhœas .....	ar.	ar. ab.	ar.	ar.
dubium.....	ar.	m. pl.	m. pl.	ar.
Lecoqii.....	...	...	...	...
† somniferum .....	...	1*	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
MRCONOPSIS Cambrica .....	...	...	...	...
ROEMERIA hybrida .....	...	...	...	...
GLAUCIUM luteum .....	1 s. *	...	...	...
CHELIDONIUM majus .....	sev. pl.	m. pl.	m. pl.	m. pl.
CORYDALIS solida .....	...	...	1 s. *	...
† lutea .....	1 s.	...	1 s.	...
claviculata .....	...	2	m. pl.	1
FUMARIA capreolata .....	...	m. pl.	m. pl.	r. u.
(including varieties)				
officinalis .....	ar.	ar. ab.	ar.	ar.
micrantha .....	...	...	...	...
parviflora .....	...	...	...	...
Vaillantii .....	...	...	...	...
MATTHIOLA incana .....	...	...	...	...
sinuata .....	...	...	...	...
† CHEIRANTHUS Cheiri .....	occ.	occ.	occ.	occ.
NASTURTIUM officinale .....	gen.	gen.	gen.	sev. pl.
amphibium .....	sev. pl.	m. pl.	sev. pl.	r. u.
sylvestre .....	1	ab.	m. pl.	...
palustre .....	1	ab.	m. pl.	occ.
BARBARA vulgaris .....	gen.	gen.	gen.	gen.
stricta .....	...	...	...	...
† præcox .....	...	1 s.	1 s.	...
TURBITIS glabra .....	...	sev. pl.	1	2
ARABIS hirsuta .....	...	...	...	...
ciliata .....	...	...	...	...
stricta .....	...	...	...	...
petræa .....	...	...	...	...
Turrita .....	...	...	...	...
CARDAMINE impatiens .....	...	m. pl. ab.	m. pl.	sev. pl.
sylvatica .....	gen.	gen.	gen.	gen.
hirsuta .....	gen.	gen.	gen.	gen.
pratensis .....	gen.	gen.	gen.	gen.
amara .....	r. u.	n. u.	r. u.	n. u.
DENTARIA bulbifera .....	...	...	...	...
HESPERIS matronalis .....	...	1	2	1
SISYMBRIUM officinale .....	gen.	gen.	gen.	gen.
Irio .....	...	...	...	...
Sophia .....	...	3	...	...
thalianum .....	gen.	gen.	gen.	n. u.
ALLIARIA officinalis .....	gen.	gen.	gen.	gen.
ERYSIMUM cheiranthoides .....	1	3	...	1
orientale .....	...	...	...	...
BRASSICA oleracea .....	...	...	...	...
campestris (var. Rapa) .....	occ.	occ.	occ.	occ.
Napus .....	n. u.	m. pl.	m. pl.	m. pl.
monensis .....	...	...	...	...
SINAPIS nigra .....	gen.	gen.	gen.	...
arvensis .....	ar.	ar.	ar.	ar.
alba .....	1	1 s.	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<i>DIPLOTAXIS tenuifolia</i> .....	...	...	...	...
<i>muralis</i> .....	...	...	...	...
<i>Alyssum calycinum</i> .....	...	1 s. *	...	...
<i>Koniga maritima</i> .....	...	1 s. *	...	...
<i>DRABA aizoides</i> .....	...	...	...	...
<i>rupestris</i> .....	...	...	...	...
<i>incana</i> .....	...	...	...	...
<i>muralis</i> .....	...	...	...	...
<i>verna</i> .....	ab.	var. loc.	m. pl.	m. pl.
<i>COCHLEARIA officinalis</i> .....	...	...	...	...
<i>danica</i> .....	...	...	...	...
<i>anglica</i> .....	...	...	...	...
<i>Armoracia rusticana</i> .....	sev. pl.	sev. pl.	sev. pl.	occ.
<i>Camelina sativa</i> .....	...	sev. pl.	sev. pl.	1
<i>THLASPI arvense</i> .....	ar.	ar.	ar.	ar.
<i>perfoliatum</i> .....	1	...	...	...
<i>alpestre</i> .....	...	...	...	...
<i>virens</i> .....	...	...	...	...
<i>HUTCHINSIA petraea</i> .....	...	...	...	...
<i>TEREDALIA nudicaulis</i> .....	1	2 ab.	2	...
† <i>Iberis amara</i> .....	...	1 s.	1 s. *	...
<i>LEPIDIDIUM Draba</i> .....	...	...	1 ab.	...
<i>campestre</i> .....	gen.	gen.	gen.	gen.
<i>Smithii</i> .....	...	m. pl.	m. pl.	2
† <i>sativum</i> .....	...	occ.†	occ.†	...
<i>rudérale</i> .....	...	3	...	...
<i>latifolium</i> .....	...	1	...	...
<i>CAPSELLA Bursa-pastoris</i> .....	gen.	gen.	gen.	gen.
<i>SUBULARIA aquatica</i> .....	...	...	...	...
<i>SENEBERRIA Coronopus</i> .....	n. u.	ab.	n. u.	v. u.
<i>didyma</i> .....	...	...	...	...
<i>ISATIS tinctoria</i> .....	...	1 ab.	...	...
<i>CAKILE maritima</i> .....	...	...	...	...
<i>CRAMBE maritima</i> .....	...	...	...	...
<i>RAPHANUS Raphanistrum</i> .....	ar.	ar.	ar.	ar.
<i>maritimus</i> .....	...	...	...	...
<i>RESEDA lutea</i> .....	2	...	...	1
† <i>suffruticulosa</i> .....	...	2 s. *	...	1 s.
<i>Luteola</i> .....	m. pl.	m. pl.	m. pl.	n. u.
<i>HELIANTHEMUM guttatum</i> .....	...	...	...	...
<i>Breweri</i> .....	...	...	...	...
<i>canum</i> .....	...	...	...	...
<i>vulgare</i> .....	ab.	m. pl.	m. pl.	sev. pl.
<i>polifolium</i> .....	...	...	...	...
<i>VIOLA palustris</i> .....	...	2	...	2
<i>odorata</i> .....	m. pl.	ab.	ab.	ab.
<i>hirta</i> .....	m. pl.	m. pl.	m. pl.	r. u.
<i>sylvatica (canina auct.)</i> .....	m. pl.	gen.	gen.	n. c.
<i>pumila (can. Bab.)</i> .....	n. u.	var. loc.	var. loc.	r. u.
<i>lutea</i> .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<i>VIOLA tricolor</i> .....	gen.	gen.	gen.	gen.
<i>stagnina</i> .....	...	...	...	...
<i>DROSERÄ rotundifolia</i> .....	...	v. u.	1	2
<i>longifolia</i> .....	...	...	...	...
<i>anglica</i> .....	...	...	...	...
<i>PARNASSIA palustris</i> .....	2*	1	...	2
<i>POLYGALA vulgaris</i> .....	ab.	n. u.	n. u.	ab.
<i>calcareæ</i> .....	...	...	...	...
<i>FRANKENIA lævis</i> .....	...	...	...	...
<i>pulverulenta</i> .....	...	...	...	...
<i>ELATINE hexandra</i> .....	...	1	...	...
<i>Hydropiper</i> .....	...	1	...	...
<i>DIANTHUS prolifer</i> .....	...	...	1*	...
<i>Armeria</i> .....	sev. pl.	sev. pl.	sev. pl.	...
<i>plumarius</i> .....	...	...	...	...
<i>Caryophyllus</i> .....	...	...	...	...
<i>cæsius</i> .....	...	...	...	...
<i>deltoides</i> .....	...	2	...	1
<i>SAPONARIA officinalis</i> .....	...	sev. pl.	1	2
<i>CUCUBALUS bacciferus</i> .....	...	...	...	...
<i>SILENE anglica</i> .....	...	1*	...	..
<i>nutans</i> .....	...	...	...	...
<i>Italica</i> .....	...	...	...	...
<i>Otites</i> .....	...	...	...	...
<i>inflata</i> .....	1	n. u.	n. u.	n. c.
<i>maritima</i> .....	...	...	...	...
<i>conica</i> .....	...	1*	...	...
<i>noctiflora</i> .....	...	...	...	...
<i>Armeria</i> .....	...	...	...	...
<i>alpestris</i> .....	...	...	...	...
<i>acaulis</i> .....	...	...	...	...
<i>LYCHNIS Viscaria</i> .....	...	...	...	...
<i>alpina</i> .....	...	...	...	...
<i>Flos-cuculi</i> .....	gen.	gen.	gen.	gen.
<i>vespertina</i> .....	gen.	gen.	gen.	gen.
<i>diurna</i> .....	gen.	gen.	gen.	gen.
† <i>Githago</i> .....	ar.	ar.	ar.	ar.
<i>SAGINA procumbens</i> .....	gen.	gen.	gen.	gen.
<i>apetala</i> .....	r. u.	gen.	gen.	n. c.
<i>ciliata</i> .....	...	1	1 ?	...
<i>maritima</i> .....	...	...	...	...
<i>saxatilis</i> .....	...	...	...	...
<i>subulata</i> .....	...	...	...	...
<i>nodosa</i> .....	...	...	v. u.	...
<i>HONKENEJA peploides</i> .....	...	...	..	...
<i>ALSINE stricta</i> .....	...	...	...	...
<i>verna</i> .....	...	...	...	...
<i>rubella</i> .....	...	...	...	...
<i>tenuifolia</i> .....	1	...	1*	...
<i>CHEERLEIA sedoides</i> .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>ARENARIA</b> trinervis.....	n. u.	gen.	gen.	gen.
serpyllifolia .....	gen.	gen.	gen.	gen.
leptoclados .....	...	...	...	...
ciliata.....	...	...	...	...
norvegica .....	...	...	...	...
<b>HOLOSTEUM</b> umbellatum .....	...	...	...	...
<b>STELLARIA</b> nemorum .....	...	1	...	1*
media .....	gen.	gen.	gen.	gen.
Holostea .....	gen.	gen.	gen.	gen.
glauca .....	...	...	...	...
graminea .....	gen.	gen.	gen.	gen.
uliginosa .....	gen.	gen.	gen.	gen.
<b>MALACHIUM</b> aquaticum .....	sev. pl.	m. pl.	sev. pl.	1
<b>CERASTIUM</b> glomeratum.....	gen.	gen.	gen.	gen.
triviale .....	gen.	gen.	gen.	gen.
semidecandrum .....	n. c.	n. u.	n. u.	1
pumilum .....	...	...	...	...
tetrandrum .....	...	...	...	...
arvense .....	...	1	...	...
latifolium.....	...	...	...	...
alpinum .....	...	...	...	...
trigynum.....	...	...	...	...
<b>MOENCHIA</b> erecta .....	...	1	ab.	1
<b>MALVA</b> moschata.....	sev. pl.	m. pl.	m. pl.	m.pl.ab.
sylvestris .....	gen.	gen.	gen.	gen.
rotundifolia .....	n. c.	var. loc.	var. loc.	n. c.
borealis .....	...	...	...	...
verticillata .....	...	...	...	...
<b>ALTHEA</b> officinalis .....	...	...	...	...
hirsuta .....	...	...	...	...
<b>LAVATEA</b> arborea .....	...	...	...	...
<b>TILIA</b> europæa.....	...	m. pl.	m. pl.	1†
parvifolia .....	...	m. pl.	m. pl.	...
†grandifolia .....	...	2 s.	2 s.	...
<b>HYPERICUM</b> †calycinum.....	...	...	1†	...
Androsæmum.....	r. u.	r. u.	n. u.	1 ab.
quadrangulum .....	ab.	ab.	n. u.	ab.
dubium .....	sev. pl.	plent.	m. pl.	n. u.
perforatum .....	gen.	gen.	gen.	gen.
humifusum.....	r. u.	sev. pl.	m. pl.	sev. pl.
linariifolium .....	...	...	...	...
barbatum .....	...	...	...	...
hirsutum.....	ab.	ab.	ab.	n. u.
montanum .....	1	2 ab.	1	...
pulchrum .....	sev. pl.	m. pl.	m. pl.	sev. pl.
elodes .....	...	...	...	1*
<b>ACEE</b> campestre .....	ab.	gen.	gen.	gen.
†Pseudo-platanus.....	occ.	occ.	occ.	occ.
<b>GERANIUM</b> phæum .....	...	2 s.	1 s.	1
striatum .....	...	1*	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>GERANIUM</b> <i>sylvaticum</i> .....	...	1 ab.	...	1
<i>pratense</i> .....	n. u.	gen.	gen.	n. u.
<i>sanguineum</i> .....	...	1	...	...
<i>pyrenaicum</i> .....	1	3	...	...
<i>pusillum</i> .....	n. u.	ab.	ab.	ab.
<i>dissectum</i> .....	gen.	gen.	gen.	gen.
<i>columbinum</i> .....	sev. pl.	sev. pl.	m. pl.	r. u.
<i>rotundifolium</i> .....	2	1	1	1
<i>molle</i> .....	gen.	gen.	gen.	gen.
<i>lucidum</i> .....	...	m. pl.	m. pl.	r. u.
<i>robertianum</i> .....	gen.	gen.	gen.	gen.
<b>ERODIUM</b> <i>cicutarium</i> .....	r. u.	m. pl.	sev. pl.	1
<i>moschatum</i> .....	1 s.	...	1*	1 s.
<i>maritimum</i> .....	...	3	1	1
<b>LINUM</b> <i>angustifolium</i> .....	...	...	...	...
<i>†usitatissimum</i> .....	occ.	occ.	occ.	occ.
<i>perenne</i> .....	...	...	...	...
<i>catharticum</i> .....	gen.	gen.	gen.	gen.
<b>RADIOLA</b> <i>millegrana</i> .....	1	2	...	1
<b>IMPATIENS</b> <i>Noli-me-tangere</i> .....	...	...	...	...
<i>fulva</i> .....	...	...	...	...
<b>OXALIS</b> <i>Acetosella</i> .....	gen.	gen.	gen.	ab.
<i>corniculata</i> .....	...	...	...	...
<b>STAPHYLEA</b> <i>pinnata</i> .....	...	...	...	...
<b>EUONYMUS</b> <i>europæus</i> .....	gen.	gen.	var. loc.	sev. pl.
<b>RHAMNUS</b> <i>catharticus</i> .....	sev. pl.	m. pl.	m. pl.	n. u.
<i>Frangula</i> .....	...	4	...	2
<b>ULEX</b> <i>europæus</i> .....	gen.	gen.	gen.	sev. pl.
<i>nanus</i> .....	...	2	r. u.	r. u.
<i>Gallii</i> .....	2	n. u.	ab.	ab.
<b>GENISTA</b> <i>pilosa</i> .....	...	...	1*	...
<i>tinctoria</i> .....	gen.	gen.	gen.	gen.
<i>anglica</i> .....	...	sev. pl.	v. u.	1
<b>SAROTHAMNUS</b> <i>scoparius</i> .....	sev. pl.	m. pl.	ab.	ab.
<b>ONONIS</b> <i>arvensis</i> .....	m. pl.	n. u.	n. u.	1
<i>antiquorum (spinosa)</i> .....	sev. pl.	sev. pl.	sev. pl.	sev. pl.
<i>reclinata</i> .....	...	...	...	...
<b>MEDICAGO</b> <i>†sativa</i> .....	occ.†	occ.†	occ.†	...
<i>sylvestris</i> .....	...	...	...	...
<i>falcata</i> .....	...	...	...	...
<i>lupulina</i> .....	n. u.	n. u.	n. u.	n. u.
<i>maculata</i> .....	...	4 ab.	1	...
<i>denticulata</i> .....	...	...	...	1 ?
<i>minima</i> .....	...	...	...	...
<b>MELILOTUS</b> <i>officinalis</i> .....	n. u.	sev. pl.	m. pl.	1
<i>arvensis</i> .....	...	2*	...	...
<i>vulgaris</i> .....	...	...	...	...
<b>TRIFOLIUM</b> <i>pratense</i> .....	gen.	gen.	gen.	gen.
<i>medium</i> .....	plent.	n. u.	n. u.	n. u.
<i>ochroleucum</i> .....	...	1	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. and Lickey.
<b>TRIFOLIUM</b> <i>Molinerii</i> .....	...	...	...	...
<i>tincarnatum</i> .....	...	occ.†	...	...
<i>stellatum</i> .....	...	...	...	...
<i>arvense</i> .....	r. u.	ab.	r. u.	...
<i>striatum</i> .....	r. u.	r. u.	plent.	...
<i>scabrum</i> .....	...	...	...	...
<i>Bocconi</i> .....	...	...	...	...
<i>maritimum</i> .....	...	...	...	...
<i>subterraneum</i> .....	...	...	...	...
<i>glomeratum</i> .....	...	...	...	...
<i>strictum</i> .....	...	...	...	...
<i>suffocatum</i> .....	...	...	...	...
<i>repens</i> .....	gen.	gen.	gen.	gen.
<i>ornithopodioides</i> .....	...	...	...	...
<i>fragiferum</i> .....	n. u.	n. u.	sev. pl.	v. u.
<i>resupinatum</i> .....	...	...	...	...
<i>procumbens</i> .....	gen.	gen.	gen.	gen.
<i>minus</i> .....	gen.	gen.	gen.	gen.
<i>filiforme</i> .....	sev. pl.	sev. pl.	sev. pl.	r. u.
<b>LOTUS</b> <i>corniculatus</i> .....	gen.	gen.	gen.	gen.
<i>major</i> .....	sev. pl.	sev. pl.	m. pl.	sev. pl.
<i>tenuis</i> or <i>tenuifolius</i> .....	sev. pl.	sev. pl.	1	1
<i>angustissimus</i> .....	...	...	...	...
<i>hispidus</i> .....	...	...	...	...
<b>ANTHYLLIS</b> <i>vulneraria</i> .....	sev. pl.	1 ab.	m. pl.	sev. pl.
<b>OXYTROPUS</b> <i>Halleri</i> .....	...	...	...	...
<i>campestris</i> .....	...	...	...	...
<b>ASTRAGALUS</b> <i>hypoglottis</i> .....	2	...	...	...
<i>alpinus</i> .....	...	...	...	...
<i>glycyphyllos</i> .....	sev. pl.	sev. pl.	sev. pl.	...
<b>VICIA</b> <i>hirsuta</i> .....	n. u.	gen.	sev. pl.	gen.
<i>tetrasperma</i> .....	gen.	gen.	m. pl.	sev. pl.
<i>gracilis</i> .....	...	1	1	...
<i>sylvatica</i> .....	1	m. pl.	ab.	...
<i>Orobis</i> .....	...	...	...	...
<i>Cracca</i> .....	gen.	var. loc.	gen.	gen.
<i>bithynica</i> .....	...	1	4	...
<i>sepium</i> .....	gen.	gen.	gen.	gen.
<i>hybrida</i> .....	...	...	...	...
<i>lutea</i> .....	...	...	...	...
<i>sativa</i> .....	m. pl.	gen.	sev. pl.	gen.
<i>lathyroides</i> .....	...	1	1 p	...
<b>LATHYRUS</b> <i>Aphaca</i> .....	2	3	2	...
<i>Nissolia</i> .....	sev. pl.	m. pl.	sev. pl.	...
<i>hirsutus</i> .....	...	...	...	...
<i>pratensis</i> .....	gen.	gen.	gen.	gen.
<i>sylvestris</i> .....	3 ab.	3	1	...
<i>latifolius</i> .....	...	1 s.*	...	...
<i>palustris</i> .....	...	...	2	...
<i>maritimus</i> .....	...	...	...	...



NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
LATHYRUS niger .....	...	...	...	...
OEOBUS tuberosus .....	gen.	gen.	gen.	gen.
β. tenuifolius .....	...	1	1	...
Coronilla varia .....	...	1 ab.	...	...
ORNITHOPUS perpusillus .....	...	r. u.	n. u.	r. u.
ATHROLOBEUM ebracteatum .....	...	...	...	...
HIPPOCREPIS comosa .....	2 ab.	...	...	...
†ONOBRYCHIS sativa .....	sev. pl.	2 ab.	m. pl.	...
PRUNUS spinosa .....	gen.	gen.	gen.	gen.
insititia .....	1	2	2	1 s.
domestica .....	occ.	occ.	occ.	r. u.
Padus .....	...	...	...	...
Avium .....	sev. pl.	ab.	ab.	sev. pl.
Cerasus .....	...	1	1	...
SPIRÆA salicifolia .....	...	1 s.	1*	...
Ulmaria .....	gen.	gen.	gen.	gen.
Filipendula .....	2 ab.	sev. pl.	2	...
SANGUISORBA officinalis .....	2 ab.	m. pl.	sev. pl.	m. pl.
POTERIUM Sanguisorba .....	ab.	m. pl.	m. pl.	r. u.
muricatum .....	1 ab.	...	1	...
AGRIMONIA Eupatoria .....	gen.	gen.	gen.	r. u.
odorata .....	1	1	1	1
ALCHEMILLA vulgaris .....	sev. pl.	n. u.	n. u.	n. u.
alpina .....	...	...	...	...
arvensis .....	gen.	gen.	gen.	gen.
SIBBALDIA procumbens .....	...	...	...	...
POTENTILLA rupestris .....	...	...	...	...
anserina .....	gen.	gen.	gen.	gen.
argentea .....	...	sev. pl.	sev. pl.	...
intermedia .....	...	...	...	...
verna .....	...	...	3	...
alpestris .....	...	...	...	...
reptans .....	gen.	gen.	gen.	gen.
Tormentilla .....	gen.	gen.	gen.	gen.
procumbens .....	...	...	2 ab.	1
fruticosa .....	...	...	...	...
fragariastrum .....	gen.	gen.	gen.	gen.
COMARUM palustre .....	...	3	...	1
FRAGARIA vesca .....	gen.	gen.	gen.	gen.
elator .....	1	...	...	...
RUBUS saxatilis .....	...	1	...	...
suberectus .....	...	3	...	sev. pl.
Idæus .....	r. u.	ab.	m. pl.	ab.
cæsius .....	m. pl.	m. pl.	m. pl.	sev. pl.
discolor (fruticosus) .....	gen.	gen.	gen.	gen.
<i>The other forms of fruticose Rubi are enumerated separately.</i>				
RUBUS Chamæmorus .....	...	...	...	...
DEYAS octopetala .....	...	...	...	...
GEUM urbanum .....	gen.	gen.	gen.	gen.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<i>GEUM intermedium</i> .....	...	...	1	sev. pl.
<i>rivale</i> .....	1	1	2	sev. pl.
<i>ROSA</i> † <i>cinnamomea</i> .....	...	1 s.	...	...
<i>rubella</i> .....	...	...	...	...
<i>spinosissima</i> .....	sev. pl.	var. loc.	sev. pl.	2
<i>hibernica</i> .....	...	...	...	...
<i>Wilsoni</i> .....	...	...	...	...
<i>involuta</i> .....	...	...	...	...
<i>Sabini</i> (and <i>Doniana</i> ).....	1	4	1	1
<i>villosa</i> .....	n. c.	m. pl.	sev. pl.	m. pl.
<i>tomentosa</i> .....	sev. pl.	m. pl.	m. pl.	sev. pl.
<i>inodora</i> .....	1	m. pl.	m. pl.	1
<i>micrantha</i> .....	sev. pl.	sev. pl.	sev. pl.	...
<i>rubiginosa</i> .....	m. pl.	m. pl.	m. pl.	r. u.
<i>sepium</i> .....	...	...	1	...
<i>canina</i> (and vars.).....	gen.	gen.	gen.	gen.
<i>bractescens</i> .....	...	...	...	...
<i>glaucophylla</i> ( <i>hispida</i> , Des. ?)	...	...	1	...
<i>coesia</i> .....	...	...	...	...
<i>systyla</i> .....	1	1	sev. pl.	1
<i>arvensis</i> .....	gen.	gen.	gen.	gen.
<i>CRATEGUS Oxyacantha</i> .....	gen.	gen.	gen.	gen.
<i>COTONEASTER vulgaris</i> .....	...	...	...	...
<i>Mespilus germanica</i> .....	...	1	...	...
<i>PRUNUS communis</i> .....	v. u.	m. pl.	m. pl.	sev. pl.
<i>Malus</i> .....	sev. pl.	m. pl.	m. pl.	sev. pl.
<i>domestica</i> .....	...	1*	...	...
<i>aucuparia</i> .....	...	v. u.	r. u.	sev. pl.
<i>fennica</i> .....	...	...	...	...
<i>Aria</i> .....	1	1	...	...
<i>scandica</i> .....	...	...	...	...
<i>torminalis</i> .....	gen.	gen.	gen.	r. u.
<i>LYTHRUM Salicaria</i> .....	gen.	gen.	gen.	r. u.
<i>Hyssopifolia</i> .....	2*	...	...	...
<i>PEPLIS Portula</i> .....	1	sev. pl.	sev. pl.	2
<i>TAMARIX anglica</i> .....	...	...	...	...
<i>EPILOBIUM angustifolium</i> .....	...	4	2	1
<i>hirsutum</i> .....	gen.	gen.	gen.	gen.
<i>parviflorum</i> .....	n. u.	gen.	gen.	n. u.
<i>montanum</i> .....	gen.	gen.	gen.	gen.
<i>lanceolatum</i> .....	...	...	...	...
<i>roseum</i> .....	...	2	3	...
<i>tetragonum</i> .....	1	gen.	gen.	m. pl.
<i>obscurum</i> .....	...	...	1	...
<i>palustre</i> .....	gen.	gen.	n. u.	n. u.
<i>alpinum</i> .....	...	...	...	...
<i>alsinifolium</i> .....	...	...	...	...
<i>CENOTHEA biennis</i> .....	1 s.*	...	1 s.*	...
<i>ISNARDIA palustris</i> .....	...	...	...	...
<i>CIRCŒA lutetiana</i> .....	r. u.	gen.	gen.	gen.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
CIRCÆA alpina .....	...	...	...	...
MYRIOPHYLLUM verticillatum .....	...	2	2	...
spicatum .....	...	m. pl.	m. pl.	1
alterniflorum .....	...	...	1	...
HIPPURIS vulgaris .....	...	1	1 ab.	...
BRYONIA dioica .....	gen.	gen.	n. u.	gen.
MONTIA fontana .....	...	n. c.	ab.	n. u.
CORRIGIOLA littoralis .....	...	...	...	...
HEERNIARIA glabra .....	...	...	...	...
ciliata .....	...	...	...	...
ILLECEBRUM verticillatum .....	...	...	...	...
POLYCARPON tetraphyllum .....	...	...	...	...
LEPIGONUM rubrum .....	...	r. u.	n. u.	v. u.
rupestre .....	...	...	...	...
medium .....	2	1 ab.	...	...
marinum .....	...	...	...	...
SPEGULA arvensis .....	ar.	ar.	ar.	ar.
SOLEANTHUS annuus .....	occ.	gen.	ab.	n. u.
perennis .....	...	...	...	...
TILLEA muscosa .....	...	...	...	...
SEDUM Rhodiola .....	...	...	...	...
Telephium .....	...	sev. pl.	m. pl.	1
purpureum .....	...	1	...	...
villosum .....	...	...	...	...
album .....	1†	3†	1	...
dasyphyllum .....	1 s.*	2 s.	...	...
anglicum .....	...	...	...	...
acre .....	gen.	ab.	ab.	ab.
sexangulare .....	...	...	...	...
reflexum .....	1	sev. pl.	sev. pl.	...
rupestre .....	...	...	2†	...
Forsterianum .....	...	...	...	...
†SEMPERVIVUM tectorum .....	gen.†	gen.†	gen.†	gen.†
† montanum .....	...	1†	...	...
COTYLEDON Umbilicus .....	...	sev. pl.	m. pl.	1
RIBES Grossularia .....	sev. pl.	m. pl.	m. pl.	occ. s.
alpinum .....	...	...	...	2 s.
nigrum .....	...	r. u.	v. u.	2
rubrum .....	...	m. pl.	m. pl.	sev. pl.
sanguineum .....	...	...	1†	1†
SAXIFRAGA umbrosa .....	...	1 s.	...	...
Geum .....	...	...	...	...
Stellaris .....	...	...	...	...
Hirculus .....	...	...	...	...
aizoides .....	...	...	...	...
muscoides .....	...	...	...	...
cæspitosa .....	...	...	...	...
hirta .....	...	...	...	...
affinis .....	...	...	...	...
hypnoides .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
SAXIFRAGA lætevirens .....	...	...	...	...
pedatifida .....	...	...	...	...
tridactylites .....	sev. pl.	m. pl.	m. pl.	sev. pl.
granulata .....	3	m. pl.	sev. pl.	2
cernua .....	...	...	...	...
riyularis .....	...	...	...	...
nivalis .....	...	...	...	...
oppositifolia .....	...	...	...	...
CHRYSOSPLENIUM oppositifolium ..	...	gen.	gen.	gen.
alternifolium ..	...	sev. pl.	m. pl.	sev. pl.
HYDROCOTYLE vulgaris .....	r. u.	m. pl.	n. u.	n. u.
SANICULA europea .....	gen.	gen.	gen.	gen.
<i>Astrantia major</i> .....	...	...	1*	...
ERYNGIUM maritimum .....	...	...	...	...
campestre .....	...	...	...	...
CICUTA virosa .....	...	...	...	...
APIUM graveolens .....	m. pl.	sev. pl.	2 ab.	...
PETROSELINUM <i>sativum</i> .....	...	sev. pl. †	2†	...
segetum .....	2	4	2	...
TRINIA vulgaris .....	...	...	...	...
HELOSCIADUM nodiflorum .....	gen.	gen.	gen.	gen.
repens .....	1	1	sev. pl.	...
inundatum .....	...	1	1	1
SISON Amomum .....	n. u.	var. loc.	n. u.	r. u.
ÆGOPDIUM Podagraria .....	gen.	2 s.	gen.	gen.
CARUM <i>Carui</i> .....	...	...	...	...
verticillatum .....	...	...	...	...
BUNIUM flexuosum .....	gen.	gen.	gen.	gen.
Bulbocastanum .....	...	...	...	...
PIMPINELLA magna .....	m. pl.	3	2	...
Saxifraga .....	ab.	gen.	gen.	gen.
SIUM latifolium .....	...	1*	...	...
angustifolium .....	1 ab.	sev. pl.	2	...
BUPLEURUM tenuissimum .....	1	1*	2	...
aristatum .....	1 ?	...	...	...
falcatum .....	...	...	...	...
rotundifolium .....	2 ab.	2	1	...
ŒNANTHE fistulosa .....	sev. pl.	m. pl.	sev. pl.	1
pimpinelloides .....	1	1	4 ab.	...
Lachenalii .....	2	1	2	...
silaifolia .....	...	sev. pl.	sev. pl.	...
crocata .....	...	sev. pl.	ab.	...
Phellandrium .....	...	m. pl.	sev. pl.	1
fluviatilis .....	...	...	...	...
ÆTHUSA Cynapium .....	gen.	gen.	gen.	gen.
FENICULUM officinale .....	1 s.	2 s.	1 s.	...
SESELI Libanotis .....	...	...	...	...
HALOSCIA scoticum .....	...	...	...	...
SILAUS pratensis .....	gen.	gen.	gen.	gen.
MEUM athamanticum .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
CRITHMUM maritimum .....	...	...	...	...
ANGELICA sylvestris .....	gen.	gen.	gen.	gen.
ARCHANGELICA officinalis .....	...	1 s.*	...	...
PEUCEDANUM officinale .....	...	...	...	...
palustre .....	...	...	...	...
Ostruthium .....	...	...	...	...
PASTINACA sativa .....	ab.	gen.	gen.	gen.
HERACLEUM Sphondylium .....	gen.	gen.	gen.	gen.
TORDYLIUM maximum .....	...	...	...	...
officinale .....	...	...	...	...
DAUCUS Carota .....	gen.	gen.	gen.	gen.
maritimus .....	...	...	...	...
CAUCALIS daucoides .....	1*	1	...	...
latifolia .....	...	...	...	...
TORILIS Anthriscus .....	n. u.	var. loc.	n. u.	ab.
infesta .....	sev. pl.	m. pl.	m. pl.	r. u.
nodosa .....	2	sev. pl.	sev. pl.	...
SCANDIX Pecten-Veneris .....	gen.	gen.	gen.	gen.
ANTHRISCUS sylvestris .....	gen.	gen.	gen.	gen.
Cerefolium .....	...	2 s.	...	2 s.
vulgaris .....	gen.	gen.	gen.	gen.
CHEROPHYLLUM temulum .....	gen.	gen.	gen.	gen.
aureum .....	...	...	...	...
aromaticum .....	...	...	...	...
MYRRHIS odorata .....	...	...	1	...
ECHINOPHORA spinosa .....	...	...	...	...
CONIUM maculatum .....	gen.	gen.	gen.	r. u.
PHYSOSPERMUM cornubiense .....	...	...	...	...
SMYRNIUM Olusatrum .....	2 ab.	2	...	...
COBIANDRUM sativum .....	...	...	...	...
ADOXA Moschatellina .....	r. u.	plent.	4 ab.	plent.
HEDERA Helix .....	gen.	gen.	gen.	gen.
CORNUS sanguinea .....	gen.	gen.	gen.	n. u.
suecica .....	...	...	...	...
VISCUM album .....	n. u.	ab.	ab.	1
SAMBUCUS Ebulus .....	...	1	3	1*
nigra .....	gen.	gen.	gen.	gen.
VIBURNUM Lantana .....	m. pl.	r. u.	r. u.	1
Opulus .....	gen.	gen.	gen.	gen.
LONICERA Caprifolium .....	...	1 s.	...	...
Periclymenum .....	gen.	gen.	gen.	gen.
Xylosteum .....	...	2	2	...
LINNEA borealis .....	...	...	...	...
SHEARDIA arvensis .....	gen.	gen.	gen.	gen.
ASPERULA cynanchica .....	3	...	...	...
odorata .....	gen.	var. loc.	m. pl.	gen.
arvensis .....	...	...	...	...
GALIUM boreale .....	...	...	...	...
cruciatum .....	gen.	gen.	gen.	gen.
saccharatum .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<i>GALIUM tricornne</i> .....	sev. pl.	2 ar.	2 ar.	...
<i>Aparine</i> .....	gen.	gen.	gen.	gen.
<i>spurium</i> .....	...	...	...	...
<i>anglicum</i> .....	...	...	...	...
<i>erectum</i> .....	1	...	1	...
<i>Mollugo</i> .....	gen.	gen.	gen.	gen.
<i>verum</i> .....	gen.	gen.	gen.	gen.
<i>saxatile</i> .....	n. u.	n. u.	m. pl.	n. u.
<i>montanum</i> .....	...	...	...	...
<i>commutatum</i> .....	...	...	...	...
<i>sylvestre</i> .....	...	...	...	...
<i>uliginosum</i> .....	gen.	gen.	gen.	gen.
<i>palustre</i> .....	n. u.	n. u.	n. u.	n. u.
<i>RUBIA peregrina</i> .....	...	...	...	...
<i>CENTRANTHUS ruber</i> .....	...	1 s.	...	...
<i>VALERIANA officinalis</i> .....	gen.	gen.	gen.	gen.
<i>sambucifolia</i> .....	...	...	...	...
<i>dioica</i> .....	r. u.	gen.	n. u.	n. u.
<i>pyrenaica</i> .....	...	...	...	...
<i>VALERIANELLA olitoria</i> .....	gen.	gen.	gen.	ab.
<i>carinata</i> .....	1	1 s.	...	...
<i>Auricula</i> .....	...	...	...	...
<i>dentata</i> .....	sev. pl.	sev. pl.	sev. pl.	...
<i>eriocarpa</i> .....	...	...	1	...
<i>DIPSACUS sylvestris</i> .....	plent.	gen.	gen.	r. u.
<i>Fullonum</i> .....	...	...	...	...
<i>pilosus</i> .....	2	n. u.	n. u.	n. c.
<i>KNAUTIA arvensis</i> .....	gen.	gen.	n. u.	occ.
<i>SCABIOSA Columbaria</i> .....	3 ab.	...	...	...
<i>succisa</i> .....	gen.	plent.	gen.	gen.
<i>EUPATORIUM cannabinum</i> .....	gen.	gen.	plent.	gen.
<i>PETASITES vulgaris</i> .....	sev. pl.	gen.	gen.	gen.
<i>TUSSILAGO Farfara</i> .....	gen.	gen.	gen.	gen.
<i>ASTER Tripolium</i> .....	...	...	...	...
<i>ERIGERON canadensis</i> .....	...	...	...	...
<i>acris</i> .....	1 ab.	3	2	1
<i>alpinus</i> .....	...	...	...	...
<i>BELLIS perennis</i> .....	gen.	gen.	gen.	gen.
<i>SOLIDAGO Virgaurea</i> .....	...	n. c.	n. u.	r. u.
<i>LINOSYRIS vulgaris</i> .....	...	...	...	...
<i>INULA Helenium</i> .....	1	1 s.	2	...
<i>Conyza</i> .....	n. u.	m. pl.	m. pl.	v. u.
<i>crithmoides</i> .....	...	...	...	...
<i>PULICARIA vulgaris</i> .....	...	...	2 ab.	...
<i>dysenterica</i> .....	gen.	gen.	gen.	gen.
<i>BIDENS tripartita</i> .....	n. u.	n. u.	n. u.	n. u.
<i>cernua</i> .....	v. u.	m. pl.	sev. pl.	sev. pl.
<i>ACHILLEA Ptarmica</i> .....	sev. pl.	n. u.	m. pl.	n. u.
<i>decolorans</i> .....	...	...	...	...
<i>tomentosa</i> .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>ACHILLEA</b> Millefolium .....	gen.	gen.	gen.	gen.
tanacetifolia .....	...	...	...	...
<b>ANTHEMIS</b> tinctoria .....	...	...	...	...
arvensis.....	sev. pl.	sev. pl.	sev. pl.	1
anglica .....	...	...	...	...
Cotula .....	gen.	gen.	gen.	occ.
nobilis .....	...	1	sev. pl.	...
<b>MATRICARIA</b> Parthenium .....	sev. pl.	n. u.	n. u.	sev. pl.
inodora .....	gen.	gen.	gen.	gen.
Chamomilla .....	gen.	gen.	gen.	occ.
<b>CHRYSANTHEMUM</b> Leucanthemum..	gen.	gen.	gen.	gen.
segetum .....	ar.	ar.	ar.	ar.
<b>DIOTIS</b> maritima .....	...	...	...	...
<b>ARTEMISIA</b> Absinthium .....	r. u.	r. u.	n. u.	n. c.
campestris .....	...	...	...	...
vulgaris.. ..	gen.	gen.	gen.	n. u.
maritima .....	...	...	...	...
<b>TANACETUM</b> vulgare .....	r. u.	ab.	plent.	r. u.
<b>FILAGO</b> germanica .....	ab.	plent.	plent.	n. u.
apiculata .....	...	1	...	...
spathulata .....	...	...	...	...
minima .....	...	m. pl.	n. u.	...
gallica .....	...	...	...	...
<b>GNAPHALIUM</b> luteo-album .....	...	...	...	...
uliginosum .....	gen.	gen.	gen.	gen.
sylvaticum .....	1	r. u.	r. u.	1
norvegicum .....	...	...	...	...
supinum .....	...	...	...	...
<b>ANTENNARIA</b> dioica.....	...	1	...	...
margaritacea .....	...	1	...	...
<b>DORONICUM</b> <i>Pardalianches</i> .....	...	1 s.	...	...
<i>plantaginicum</i> .....	...	...	...	...
<b>SENECIO</b> vulgaris .....	gen.	gen.	gen.	gen.
viscosus.....	1*	...	...	...
sylvaticus .....	gen.	gen.	gen.	n. u.
squalidus .....	...	1 s.	...	...
erucifolius.....	n. u.	n. u.	n. u.	r. u.
Jacobæa .....	gen.	gen.	gen.	gen.
aquaticus .....	n. u.	n. u.	plent.	n. u.
paludosus .....	...	...	...	...
saracenicus .....	...	...	...	...
<b>CINERARIA</b> palustris .....	...	...	...	...
campestris .....	...	...	...	...
<b>SAUSSUREA</b> alpina .....	...	...	...	...
<b>CARLINA</b> vulgaris.....	n. u.	n. u.	ab.	r. u.
<b>ARCTIUM</b> majus .....	gen.	gen.	n. u.	gen.
minus .....	gen.	gen.	gen.	gen.
<b>SERRATULA</b> tinctoria .....	gen.	gen.	gen.	n. c.
<b>CENTAUREA</b> Jacea .....	...	...	...	...
nigra .....	gen.	gen.	gen.	gen.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>CENTAUREA</b> <i>β radiata</i> or " <i>nigrescens</i> "	plent.	plent.	plent.	r. u.
<i>Cyanus</i> .....	ar.	ar.	ar.	...
<i>Scabiosa</i> .....	sev. pl.	sev. pl.	m. pl.	r. u.
<i>solstitialis</i> .....	...	...	1 s.*	...
<i>Calcitrapa</i> .....	...	...	...	...
<i>Isnardi</i> .....	...	...	...	...
<b>ONOPORDUM</b> <i>Acanthium</i> .....	occ.	m. pl.	sev. pl.	occ.
<b>CARDUS</b> <i>nutans</i> .....	gen. ab.	gen.	plent.	r. u.
<i>acanthoides</i> .....	gen.	gen.	gen.	r. u.
<i>tenuiflorus</i> .....	...	...	...	...
<i>lanceolatus</i> .....	gen.	gen.	gen.	gen.
<i>eriphorus</i> .....	2 ab.	3	4	1 ab.
<i>arvensis</i> .....	gen.	gen.	gen.	gen.
<i>palustris</i> .....	gen.	gen.	gen.	gen.
<i>pratensis</i> .....	1	1	2	2
<i>Forsteri</i> .....	...	1	...	...
<i>tuberosus</i> .....	...	...	...	...
<i>acaulis</i> .....	3 ab.	1	r. u.	...
<i>heterophyllus</i> .....	...	...	...	...
<b>SILYBUM</b> <i>marianum</i> .....	occ.	var. loc.	occ.	1*
<b>LAPSA</b> <i>communis</i> .....	n. u.	gen.	gen.	gen.
<b>ARNOSEBIS</b> <i>pusilla</i> .....	1*	...	...	...
<b>CICHOBIUM</b> <i>Intybus</i> .....	n. u.	r. u.	r. u.	...
<b>HYPOCHÆRIS</b> <i>glabra</i> .....	1	1 ab.	2	...
<i>radicata</i> .....	gen.	gen.	gen.	gen.
<i>maculata</i> .....	...	...	...	...
<b>THRINICIA</b> <i>hirta</i> .....	gen.	gen.	gen.	r. u.
<b>APARGIA</b> <i>hispida</i> .....	gen.	gen.	gen.	gen.
<b>OPORINTA</b> <i>autumnalis</i> .....	gen.	gen.	gen.	gen.
<b>TRAGOPOGON</b> <i>minor</i> .....	gen.	gen.	gen.	gen.
(including " <i>pratensis</i> ")	...	...	...	...
<i>porrifolius</i> .....	...	...	1 s.	...
<b>PICRIS</b> <i>hieracioides</i> .....	sev. pl.	1 ab.	sev. pl.	1
<b>HELMINTHIA</b> <i>echioides</i> .....	sev. pl.	m. pl.	m. pl.	1
<b>LACTUCA</b> <i>saligna</i> .....	...	1*	...	...
<i>virosa</i> .....	...	1	...	...
<i>Scariola</i> .....	...	...	1	...
<i>muralis</i> .....	n. u.	m. pl.	n. u.	sev. pl.
<b>LEONTODON</b> <i>Taraxicum</i> .....	gen.	gen.	gen.	gen.
<b>SONCHUS</b> <i>oleraceus</i> .....	gen.	gen.	gen.	gen.
<i>asper</i> .....	gen.	gen.	gen.	gen.
<i>arvensis</i> .....	ar.	ar.	ar.	ab.
<i>palustris</i> .....	...	...	...	...
<b>MULGEDIUM</b> <i>alpinum</i> .....	...	...	...	...
<b>CREPIS</b> <i>taraxacifolia</i> .....	...	...	...	...
<i>setosa</i> .....	...	...	...	...
<i>fetida</i> .....	...	...	...	...
<i>pulchra</i> .....	...	...	...	...
<i>virens</i> .....	gen.	gen.	gen.	gen.
<i>biennis</i> .....	...	...	...	...



NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>CREPIS</b> succisæfolia .....	...	...	...	...
paludosa .....	...	...	...	...
<b>HIERACIUM</b> pilosella .....	gen.	gen.	gen.	gen.
aurantiacum .....	...	...	...	...
alpinum .....	...	...	...	...
holosericeum .....	...	...	...	...
eximium .....	...	...	...	...
calenduliflorum .....	...	...	...	...
gracilentum .....	...	...	...	...
globosum .....	...	...	...	...
nigrescens .....	...	...	...	...
lingulatum .....	...	...	...	...
senescens .....	...	...	...	...
chrysanthum .....	...	...	...	...
anglicum .....	...	...	...	...
iricum .....	...	...	...	...
pallidum .....	...	...	...	...
lasiophyllum .....	...	...	...	...
Gibsoni .....	...	...	...	...
argenteum .....	...	...	...	...
nitidum .....	...	...	...	...
aggregatum .....	...	...	...	...
murorum .....	sev. pl.	var. loc.	sev. pl.	r. u.
cæsius .....	...	...	...	...
floccosum .....	...	...	...	...
vulgatum .....	m. pl.	m. pl.	m. pl.	sev. pl.
gothicum .....	...	...	...	...
tridentatum .....	...	...	...	...
prenanthoides .....	...	...	...	...
strictum .....	...	...	...	...
umbellatum .....	r. u.	sev. pl.	1	r. u.
crocatum .....	...	...	...	...
corymbosum .....	...	...	...	...
boreale .....	r. u.	m. pl.	m. pl.	n. u.
<b>XANTHIUM</b> strumarium .....	...	...	...	...
<b>LOBELIA</b> Dortmanna .....	...	...	...	...
urens .....	...	...	...	...
<b>JASIONE</b> montana .....	...	sev. pl.	r. u.	r. u.
<b>PHYTEUMA</b> orbiculare .....	...	...	...	...
spicatum .....	...	...	...	...
<b>CAMPANULA</b> glomerata .....	3	...	...	1
latifolia .....	3	4	2	sev. pl.
Trachelium .....	sev. pl.	m. pl.	m. pl.	sev. pl.
† <i>rapunculoides</i> .....	1 s.	2*	...	1 s.
rotundifolia .....	sev. pl.	m. pl.	m. pl.	m. pl.
persicifolia .....	...	...	...	...
Rapunculus .....	...	1	1	...
patula .....	r. u.	n. u.	sev. pl.	n. c.
† <i>Speculum</i> .....	1 ar.	...	...	...
<b>SPECULARIA</b> hybrida .....	ar. occ.	ar. occ.	ar. occ.	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
WAHLENBERGIA hederacea .....	...	1*	...	...
ARBUTUS Unedo .....	...	...	...	...
ARCTOSTAPHYLOS alpina .....	...	...	...	...
Uva-ursi .....	...	...	...	...
ANDROMEDA polifolia .....	...	...	...	...
CALLUNA vulgaris .....	sev. pl.	var. loc.	n. c.	ab.
ERICA Tetralix .....	1	1	...	n. u.
Mackaiana .....	...	...	...	...
cinerea .....	...	n. c.	...	ab.
ciliaris .....	...	...	...	...
mediterranea .....	...	...	...	...
vagans .....	...	...	...	...
PHYLLODOCE cærulea .....	...	...	...	...
DABECIA polifolia .....	...	...	...	...
AZALEA procumbens .....	...	...	...	...
VACCINIUM Myrtillus .....	...	sev. pl.	r. u.	plent.
uliginosum .....	...	...	...	...
Vitis-idea .....	...	...	...	...
Oxycoccus .....	...	...	...	2*
PYROLA rotundifolia .....	...	...	...	...
media .....	...	2	...	1*
minor .....	...	3	...	...
secunda .....	...	...	...	...
MONENSES grandiflora .....	...	...	...	...
MONOTROPA Hypopitys .....	2 ab.	1*	...	...
ILEX Aquifolium .....	gen.	var. loc.	plent.	gen.
LIGUSTRUM vulgare .....	m. pl.	gen.	gen.	n. u.
FRAXINUS excelsior .....	gen.	gen.	gen.	gen.
VINCA minor .....	...	m. pl.	sev. pl.	...
major .....	1†	sev. pl.†	2†	sev. pl.†
CHLOEA perfoliata .....	sev. pl.	sev. pl.	m. pl.	sev. pl.
ERYTHRAEA pulchella .....	...	...	1	...
Centaurium .....	gen.	gen.	gen.	gen.
latifolia .....	...	...	...	...
littoralis .....	...	...	...	...
CICENDIA filiformis .....	...	...	...	...
GENTIANA Amarella .....	v. u.	1	r. u.	v. u.
campestris .....	...	1	...	...
nivalis .....	...	...	...	...
verna .....	...	...	...	...
Pneumonanthe .....	...	...	...	...
VILLARSA nymphaeoides .....	2	...	...	...
MENYANTHES trifoliata .....	...	3 ab.	1*	2
POLEMONIUM cæruleum .....	...	...	...	1*
CONVOLVULUS arvensis .....	gen.	gen.	gen.	sev. pl.
sepium .....	gen.	gen.	gen.	sev. pl.
Soldanella .....	...	...	...	...
CUSCUTA europæa .....	2	2	2	...
Epitimum .....	...	1 s.	1 s.	...
Epithymum .....	1	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
CUSCUTA Trifolii .....	3 ab.	...	...	...
ASPERUGO procumbens .....	...	...	...	...
CYNOGLOSSUM officinale .....	n. u.	m. pl.	sev. pl.	n. c.
montanum .....	1*	1	2	...
BORAGO officinalis .....	occ.	occ.	occ.	1
ANCHUSA officinalis .....	...	...	...	...
† <i>sempervirens</i> .....	...	2 s.*	1 s.	1 s.
LYCOPSIS arvensis .....	1	n. u.	r. u.	n. u.
SYMPHYTUM officinale .....	gen.	gen.	gen.	n. c.
tuberosum .....	...	...	...	...
ECHIAM vulgare .....	sev. pl.	sev. pl.	2	1 ab.
violaceum .....	...	...	...	...
PULMONARIA officinalis .....	...	1 s.	1 s.	1 s.
angustifolia .....	...	...	...	...
MEERTENSIA maritima .....	...	...	...	...
LITHOSPERMUM officinale .....	sev. pl.	sev. pl.	sev. pl.	1
purpureo-cæruleum .....	...	...	...	...
arvense .....	ar.	ar.	ar.	...
MYOSOTIS palustris .....	gen.	gen.	gen.	gen.
repens .....	...	1 s.	1	...
cæspitosa .....	sev. pl.	n. u.	n. u.	n. u.
alpestris .....	...	...	...	...
sylvatica .....	gen.	gen.	gen.	sev. pl.
arvensis .....	gen.	gen.	gen.	gen.
collina .....	...	r. u.	r. u.	r. u.
versicolor .....	...	n. u.	n. u.	r. u.
SOLANUM nigrum .....	sev. pl.	m. pl.	2	sev. pl.
Dulcamara .....	ab.	ab.	ab.	ab.
ATROPA Belladonna .....	...	1 s.	...	1
HYOSCYAMUS niger .....	sev. pl.	sev. pl.	sev. pl.	2
† DATURA Stramonium .....	occ.	occ.	occ.	...
OROBANCHE Rapum .....	...	sev. pl.	sev. pl.	1
rubra .....	...	...	...	...
caryophyllacea .....	...	...	...	...
elatior .....	1 ?	...	1*	...
Picridis .....	...	...	...	...
Hederæ .....	...	...	...	...
minor .....	2 ab.	v. u.	1	...
amethystea .....	...	...	...	...
arenaria .....	...	...	...	...
cærulea .....	...	...	...	...
ramosa .....	...	...	...	...
LATHRÆA squamaria .....	...	sev. pl.	sev. pl.	2
VERBASCUM Thapsus .....	sev. pl.	gen.	gen.	sev. pl.
thapsiforme .....	...	...	...	...
Lychnitis .....	...	2 ab.	...	...
pulverulentum .....	...	...	...	...
nigrum .....	...	sev. pl.	...	sev. pl.
Blattaria .....	1	occ.	occ.	1
virgatum .....	...	3	1*	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
DIGITALIS purpurea .....	gen.	var. loc.	ab.	plent.
† ANTIRRHINUM <i>majus</i> .....	occ.†	sev. pl.†	sev. pl.†	...
Orontium .....	...	3	1	...
LINARIA † <i>Cymbalaria</i> .....	sev. pl.†	m. pl.†	m. pl.†	sev. pl.†
Elatine .....	ar.	ar.	ar.	occ.
spuria .....	ar.	ar.	ar.	...
minor .....	4 ab.	1	2	...
supina .....	...	...	...	...
purpurea .....	...	...	...	...
repens .....	...	...	...	...
vulgaris .....	gen.	gen.	gen.	gen.
SCROPHULARIA <i>nodosa</i> .....	gen.	gen.	gen.	gen.
Ehrharti .....	...	...	1 ♀	1 ♀
aquatica .....	gen.	gen.	gen.	gen.
Scorodonia .....	...	...	...	...
vernalis .....	...	...	...	...
LIMOSELLA <i>aquatica</i> .....	1	...	3	1
MELAMPYRUM <i>cristatum</i> .....	...	1*	...	...
arvense .....	...	...	...	...
pratense .....	sev. pl.	gen.	gen.	gen.
sylvaticum .....	...	...	...	...
† MIMULUS <i>luteus</i> .....	...	1*	...	...
PEDICULARIS <i>palustris</i> .....	1	1	...	1
sylvatica .....	gen.	gen.	gen.	gen.
RHINANTHUS <i>Crista-galli</i> .....	gen.	gen.	gen.	gen.
major .....	...	...	...	...
BARTSIA <i>alpina</i> .....	...	...	...	...
EUPRAGIA <i>viscosa</i> .....	...	...	...	...
EUPHRASIA <i>officinalis</i> .....	gen.	gen.	ab.	plent.
Odontites .....	ab.	m. pl.	ab.	sev. pl.
SIBTHORPIA <i>europæa</i> .....	...	...	...	...
VERONICA <i>scutellata</i> .....	sev. pl.	sev. pl.	sev. pl.	1
Anagallis .....	sev. pl.	sev. pl.	n. u.	1
Beccabunga .....	gen.	gen.	gen.	gen.
Chamædrys .....	gen.	gen.	gen.	gen.
montana .....	n. u.	var. loc.	n. u.	n. u.
officinalis .....	gen.	gen.	gen.	gen.
† <i>spicata</i> .....	...	1 s. †	...	...
<i>saxatilis</i> .....	...	...	...	...
<i>alpina</i> .....	...	...	...	...
<i>serpyllifolia</i> .....	gen.	gen.	gen.	gen.
<i>peregrina</i> .....	...	...	...	...
<i>arvensis</i> .....	gen.	gen.	gen.	gen.
<i>verna</i> .....	...	...	...	...
<i>triphyllus</i> .....	...	...	...	...
<i>agrestis</i> .....	gen.	gen.	gen.	gen.
<i>polita</i> .....	r. u.	n. c.	n. c.	r. u.
† <i>Buxbaumii</i> .....	2†	m. pl.†	2†	1†
<i>hederifolia</i> .....	gen.	gen.	gen.	gen.
MENTHA <i>rotundifolia</i> .....	...	3	1 ab.	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>MENTHA</b> <i>sylvestris</i> .....	...	sev. pl.	1	...
<i>viridis</i> .....	...	1 s.	2 s.	1 s.
<i>piperita</i> .....	1	sev. pl.	sev. pl.	...
<i>aquatica</i> (and vars.) .....	gen.	gen.	gen.	gen.
<i>pratensis</i> .....	...	...	...	...
<i>sativa</i> (including vars.) ...	1	2	3	1
<i>arvensis</i> .....	gen.	gen.	gen.	gen.
<i>Pulegium</i> .....	1 ab.	3	1	2
<b>LYCOPUS</b> <i>europæus</i> .....	gen.	gen.	gen.	gen.
<b>SALVIA</b> <i>verbenaca</i> .....	3	sev. pl.	sev. pl.	1
<i>pratensis</i> .....	...	...	...	...
<b>ORIGANUM</b> <i>vulgare</i> .....	2	sev. pl.	sev. pl.	...
<b>THYMUS</b> <i>Serpyllum</i> .....	gen.	gen.	gen.	gen.
<i>Chamædrys</i> .....	2	sev. pl.	sev. pl.	occ.
<b>CALAMINTHA</b> <i>Nepeta</i> .....	...	...	...	...
<i>officinalis</i> .....	sev. pl.	gen.	gen.	...
<i>sylvatica</i> .....	...	1 ?	...	...
<i>Acinos</i> .....	3 ab.	sev. pl.	1	...
<i>Clinopodium</i> .....	sev. pl.	m. pl.	m. pl.	sev. pl.
<b>MELISSA</b> <i>officinalis</i> .....	...	occ.†	occ.†	...
<b>SCUTELLARIA</b> <i>galericulata</i> .....	n. u.	m. pl.	sev. pl.	m. pl.
<i>minor</i> .....	...	3	1	1
<b>PRUNELLA</b> <i>vulgaris</i> .....	gen.	gen.	gen.	gen.
<b>NEPETA</b> <i>Cataria</i> .....	...	n. u.	m. pl.	2
<i>Glechoma</i> .....	gen.	gen.	gen.	gen.
<b>MELITISS</b> <i>Melissophyllum</i> .....	...	...	...	1*
<b>LAMIUM</b> <i>amplexicaule</i> .....	gen.	gen.	gen.	r. u.
<i>intermedium</i> .....	...	...	...	...
<i>incisum</i> .....	...	v. u.	...	...
<i>purpureum</i> .....	gen.	gen.	gen.	gen.
<i>album</i> .....	gen.	gen.	gen.	gen.
<i>maculatum</i> .....	...	1*	...	...
<i>Galeobdolon</i> .....	n. u.	ab.	ab.	n. u.
<b>LEONURUS</b> <i>Cardiaca</i> .....	...	2 s.	...	...
<b>GALEOPSIS</b> <i>ochroleuca</i> .....	...	...	...	...
<i>Ladanum</i> .....	gen.	gen.	gen.	r. u.
<i>Tetrahit</i> .....	gen.	gen.	gen.	gen.
<i>versicolor</i> .....	1	1	...	1
<b>STACHYS</b> <i>Betonica</i> .....	n. u.	n. u.	n. u.	n. u.
<i>germanica</i> .....	...	...	...	...
<i>sylvatica</i> .....	gen.	gen.	gen.	gen.
<i>palustris</i> .....	m. pl.	m. pl.	sev. pl.	n. u.
<i>arvensis</i> .....	gen.	gen.	gen.	occ.
<i>annua</i> .....	...	...	...	...
<b>BALLOTA</b> <i>nigra</i> .....	plent.	plent.	gen.	gen.
<i>(The forms "fætida" and "ruderalis" not distinguished.)</i>				
<b>MARRUBIUM</b> <i>vulgare</i> .....	...	1	r. u.	1
<b>TEUCRIUM</b> <i>Scorodonia</i> .....	gen.	gen.	gen.	r. u.
<i>Scordium</i> .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
TEUCRIUM Chamædrys .....	...	...	...	...
Botrys .....	...	...	...	...
AJUGA reptans.....	gen.	gen.	gen.	gen.
pyramidalis .....	...	...	...	...
Chamæpitys.....	...	...	...	...
VERBENA officinalis.....	sev. pl.	m. pl.	sev. pl.	r. u.
PINGUICULA vulgaris .....	1*	...	2	1*
grandiflora.....	...	...	...	...
alpina .....	...	...	...	...
lusitanica .....	...	...	...	...
UTRICULARIA vulgaris .....	...	...	1	...
intermedia .....	...	...	...	...
minor .....	...	...	...	...
PRIMULA vulgaris .....	gen.	gen.	gen.	gen.
β. caulescens .....	r. u.	m. pl.	m. pl.	n. u.
veris.....	gen.	gen.	gen.	r. u.
elator .....	...	...	...	...
farinosa .....	...	...	...	...
scotica .....	...	...	...	...
HOTTONIA palustris.....	...	2	1	...
CYCLAMEN hederifolium.....	...	...	...	...
LYSIMACHIA thyrsoflora .....	...	...	...	...
vulgaris .....	plent.	v. u.	sev. pl.	1
ciliata .....	...	...	...	...
Nummularia .....	plent.	plent.	plent.	sev. pl.
nemorum .....	gen.	gen.	gen.	gen.
ANAGALLIS arvensis .....	gen.	gen.	gen.	gen.
β. cærulea .....	3 ab.	2	1	...
tenella .....	1*	1	1	2
CENTUNCULUS minimus .....	...	...	1	1
TRIENTALIS europæa .....	...	...	...	...
GLAUX maritima .....	...	1 ab.	...	...
SAMOLUS Valerandi.....	3	2	...	...
STATICE Limonium, Bahusiensis, Dodartii, &c.....	...	...	...	...
ARMERIA maritima .....	...	...	...	...
PLANTAGO Coronopus.....	1	sev. pl.	plent.	r. u.
maritima .....	...	1*	...	...
lanceolata .....	gen.	gen.	gen.	gen.
media.....	gen.	gen.	gen.	gen.
major .....	gen.	gen.	gen.	n. u.
LITTORELLA lacustris .....	...	...	...	1*
AMARANTHUS <i>Blitum</i> .....	...	1	...	...
SUEDA fruticosa .....	...	...	...	...
maritima.....	...	...	...	...
SALSOLA Kali .....	...	...	...	...
CHENOPODIUM olidum .....	...	...	...	...
polyspermum .....	...	sev. pl.	sev. pl.	1
urbicum.....	...	1	1	...
album.....	gen.	gen.	gen.	gen.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broma. Lickey.
<b>CHENOPODIUM ficifolium</b> .....	...	1	...	...
murale .....	...	1	...	...
hybridum .....	1	...	...	...
rubrum .....	1	m. pl.	m. pl.	...
botryoides .....	...	...	...	...
glaucum .....	...	...	...	...
Bonus-Henricus ..	var. loc.	m. pl.	sev. pl.	2
<b>BETA maritima</b> .....	...	1 ab.*	...	...
<b>SALICORNIA herbacea &amp; radicans</b> ..	...	...	...	...
<b>ATEIPLEX littoralis</b> .....	...	...	...	...
marina .....	...	...	...	...
angustifolia .....	gen.	gen.	gen.	gen.
erecta .....	...	1	...	...
deltoidea and "micros- perma" .....	...	sev. pl.	...	...
hastata (patula) ..	gen.	gen.	gen.	gen.
Babingtonii (rosea) ..	1	1 ab.	...	...
arenaria (laciniata) ..	...	...	...	...
<b>OBIONE pedunculata</b> .....	...	...	...	...
portulacoides .....	...	...	...	...
<b>RUMEX maritimus</b> .....	1	sev. pl.	sev. pl.	1
palustris .....	...	...	1	1
conglomeratus .....	gen.	gen.	gen.	gen.
sanguineus .....	...	v. u.	v. u.	...
β. viridis .....	r. u.	gen.	gen.	gen.
pulcher .....	1	1	2	...
obtusifolius .....	gen.	gen.	gen.	gen.
pratensis .....	...	1	1	...
crispus .....	gen.	gen.	gen.	gen.
aquaticus .....	...	...	...	...
Hydrolapathum .....	m. pl.	m. pl.	sev. pl.	1
alpinus .....	...	...	...	...
acetosa .....	gen.	gen.	gen.	gen.
Acetosella .....	gen.	gen.	plent.	gen.
<b>OXYRIA reniformis</b> .....	...	...	...	...
<b>POLYGONUM Bistorta</b> .....	...	n. u.	sev. pl.	sev. pl.
viviparum .....	...	...	...	...
amphibium .....	gen.	gen.	gen.	gen.
lapathifolium .....	n. u.	m. pl.	sev. pl.	1
nodosum (laxum) .....	...	...	1	...
Persicaria .....	gen.	gen.	gen.	gen.
mite .....	...	1	...	...
Hydropiper .....	gen.	gen.	gen.	r. u.
minus .....	...	...	2	...
aviculare .....	gen.	gen.	gen.	gen.
Raii .....	...	1	...	...
maritimum .....	...	...	...	...
convolvulus .....	gen.	gen.	gen.	gen.
dumetorum .....	...	...	...	...
† <b>FAGOPYRUM esculentum</b> .....	occ.†	sev. pl.†	...	occ.†

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
HIPPOPHAE rhamnoides.....	...	...	...	...
DAPHNE Mezereum .....	1*	...	2	...
Laureola .....	r. u.	var. loc.	n. u.	r. u.
THESIUM humifusum .....	...	...	...	...
humile .....	...	...	...	...
ARISTOLOCHIA Clematitis .....	..	2 s.*	...	...
ASARUM europæum .....	...	...	...	...
EMPETRUM nigrum .....	...	...	...	...
†BUXUS sempervirens .....	1†	...	...	...
EUPHORBIA Peplis .....	...	...	...	...
Helioscopia .....	gen.	gen.	gen.	gen.
stricta .....	...	...	...	...
platyphylla.....	1	...	...	...
hiberna .....	...	...	...	...
palustris .....	...	...	...	...
coralloides .....	...	...	...	...
amygdaloides.....	gen.	gen.	gen.	r. u.
Cyparissias .....	...	...	...	...
Esula .....	...	...	...	...
Paralias .....	...	...	...	...
portlandica.....	...	...	...	...
Peplus.....	gen.	gen.	gen.	gen.
exigua .....	gen.	gen.	gen.	gen.
Lathyris .....	...	occ.†	occ.†	...
MERCURIALIS perennis .....	gen.	plent.	plent.	gen.
annua .....	...	...	...	...
CERATOPHYLLUM demersum .....	1	1 ab.	2	...
submersum .....	n. u.	plent.	n. u.	1
CALLITRICHE verna.....	gen.	gen.	gen.	gen.
platycarpa .....	...	1	...	...
hamulata .....	...	...	...	...
autumnalis .....	...	...	...	...
PARIETARIA officinalis.....	occ.	gen.	gen.	n. u.
URTICA pilulifera .....	...	...	...	...
urens .....	gen.	gen.	gen.	gen.
dioica .....	gen.	gen.	gen.	gen.
HUMULUS Lupulus .....	n. u.	plent.	n. u.	r. u.
ULMUS campestris (including†“sube- rosa”) .....	ab.†	ab.†	ab.†	occ.†
glabra .....	...	occ.†	...	1†
montana .....	gen.	gen.	gen.	gen.
SALIX †pentandra .....	1 s.	1	...	1 s.
cuspidata .....	...	...	...	...
fragilis .....	gen.	gen.	gen.	n. u.
Russelliana .....	sev. pl.	n. u.	n. u.	...
alba .....	gen.	gen.	gen.	gen.
β. cærulea.....	m. pl.	gen.	gen.	gen.
vitellina .....	pl.	pl.	pl.	pl.
undulata .....	1	...	...	...
triandra and amygdalina ...	n. u.	gen.	n. u.	...



NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>SALIX</b> <i>Hoffmanniana</i> .....	...	1	...	...
<i>acutifolia</i> .....	...	...	...	...
<i>purpurea</i> and <i>Helix</i> .....	2	m. pl.	sev. pl.	...
<i>rubra</i> and <i>Forbiana</i> .....	...	...	1	...
<i>viminalis</i> .....	gen.	gen.	gen.	sev. pl.
<i>stipularis</i> .....	...	...	...	...
<i>Smithiana</i> .....	n. c.	r. u.	sev. pl.	1
<i>acuminata</i> .....	...	...	1	...
<i>cinerea</i> and <i>aquatica</i> .....	sev. pl.	m. pl.	sev. pl.	sev. pl.
<i>aurita</i> .....	1	2	2	...
<i>caprea</i> .....	gen.	gen.	gen.	gen.
<i>nigricans</i> and vars. ....	...	...	...	...
<i>laurina</i> and vars. ....	...	...	...	...
<i>phylicifolia</i> .....	...	...	...	...
<i>rosmarinifolia</i> .....	...	...	...	...
<i>angustifolia</i> .....	...	...	...	...
<i>Doniana</i> .....	...	...	...	...
<i>repens</i> and vars. ....	...	...	...	...
<i>ambigua</i> and vars. ....	...	...	...	...
<i>Arbuscula</i> .....	...	...	...	...
<i>Lapponum</i> and vars. ....	...	...	...	...
<i>lanata</i> .....	...	...	...	...
<i>Myrsinites</i> .....	...	...	...	...
<i>procumbens</i> .....	...	...	...	...
<i>reticulata</i> .....	...	...	...	...
<i>herbacea</i> .....	...	...	...	...
<b>POPULUS</b> <i>alba</i> .....	sev. pl.	sev. pl.	m. pl.	r. u.
<i>canescens</i> .....	sev. pl.	sev. pl.	sev. pl.	r. u.
<i>tremula</i> .....	n. u.	n. u.	n. u.	n. u.
<i>nigra</i> .....	n. u.	gen.	ab.	n. u.
<i>(The Italian variety is now generally planted.)</i>				
<b>MYRICA</b> <i>Gale</i> .....	...	...	...	...
<b>BETULA</b> <i>alba</i> (and " <i>glutinosa</i> ") ..	gen.	gen.	gen.	gen.
<i>nana</i> .....	...	...	...	...
<b>ALNUS</b> <i>glutinosa</i> .....	gen.	gen.	gen.	gen.
<b>FAGUS</b> <i>sylvatica</i> .....	pl.	pl.	pl.	pl.
† <b>CASTANEA</b> <i>vulgaris</i> .....	...	pl.	pl.	pl.
<b>QUERCUS</b> <i>Robur</i> .....	gen.	gen.	gen.	gen.
<i>intermedia</i> .....	...	n. u.	n. u.	...
<i>sessiliflora</i> .....	...	n. u.	n. u.	...
<b>CORYLUS</b> <i>Avellana</i> .....	gen.	gen.	gen.	gen.
<b>CARPINUS</b> <i>Betulus</i> .....	...	pl. 2	pl. 1	pl. 1
<b>TAXUS</b> <i>baccata</i> .....	r. u.	n. u.	m. pl.	sev. pl.
<b>JUNIPERUS</b> <i>communis</i> .....	2	2*	4	...
<i>nana</i> .....	...	...	...	...
† <b>PINUS</b> <i>sylvestris</i> .....	pl.	pl.	pl.	pl.
† <b>ABIES</b> <i>excelsa</i> .....	pl.	pl.	pl.	pl.
† <b>LARIX</b> <i>europæa</i> .....	pl.	pl.	pl.	pl.
✓ <b>PARIS</b> <i>quadrifolia</i> .....	gen.	r. u.	plent.	r. u.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
TAMUS communis .....	n. u.	n. u.	plent.	n. u.
HYDROCHARIS Morsus-ranæ .....	...	n. u.	r. u.	...
STRATIOTES aloides .....	...	...	...	...
ANACHARIS Alsinastrum .....	sev. pl.	m. pl.	...	1
ORCHIS Morio .....	m. pl.	m. pl.	ab.	plent.
mascula .....	gen.	gen.	gen.	gen.
fusca .....	...	...	...	...
militaris .....	...	...	...	...
Simia .....	...	...	...	...
ustulata .....	...	1	3	...
maculata .....	gen.	gen.	gen.	gen.
latifolia .....	2	sev. pl.	sev. pl.	1
incarnata .....	...	1 ♀	...	...
pyramidalis .....	sev. pl.	2*	m. pl.	...
hircina .....	...	...	...	...
GYMNA DENIA conopsea .....	2 ab.	sev. pl.	m. pl.	v. u.
albida .....	...	...	...	1 ♀*
ACERAS anthropophora .....	...	...	...	...
HABENARIA viridis .....	sev. pl.	2	m. pl.	1
bifolia .....	...	2	sev. pl.	m. pl.
chlorantha .....	sev. pl.	m. pl.	plent.	...
OPHEYS apifera .....	sev. pl.	sev. pl.	sev. pl.	2
arachnites .....	...	...	...	...
aranifera .....	...	...	...	...
muscifera .....	...	...	1	...
HERMINIUM Monorchis .....	...	...	...	...
GOODYERA repens .....	...	...	...	...
SPIRANTHES autumnalis .....	...	m. pl.	sev. pl.	...
æstivalis .....	...	1*	...	...
cernua .....	...	...	...	...
LISTERA ovata .....	gen.	gen.	gen.	gen.
cordata .....	...	...	...	...
NEOTTIA Nidus-avis .....	...	4*	sev. pl.	2
EPIPACTIS latifolia .....	1 ab.	4	sev. pl.	2
media (including purpu- rata) .....	1	1	1	2
ovalis .....	...	...	...	...
palustris .....	...	1	3	...
CEPHALANTHERA grandiflora .....	...	2*	...	...
ensifolia .....	...	2 ab.	...	...
rubra .....	...	...	...	...
EPIPOGIUM aphyllum .....	...	...	1*	...
CORALLOBRHIZA innata .....	...	...	...	...
MALAXIS paludosa .....	...	...	...	...
STURMIA Loeselii .....	...	...	...	...
CYPRIPEDIUM Calceolus .....	...	...	...	...
IBIS Pseud-acorus .....	gen.	gen.	gen.	gen.
fetidissima .....	sev. pl.	m. pl.	m. pl.	...
GLADIOLUS illyricus .....	...	...	...	...
TRICHONEMA Columnæ .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<i>CROCUS vernus</i> .....	...	1*	...	...
† <i>sativus</i> .....	...	...	1*	...
nudiflorus.....	...	...	...	...
<i>NARCISSUS biflorus</i> .....	...	3	3	...
† <i>poeticus</i> .....	...	1 s. *	...	...
Pseudo-Narcissus.....	n. u.	var. loc.	ab.	m. pl.
lobularis.....	...	...	1 s. *	...
<i>LEUCOJUM aestivum</i> .....	...	...	...	...
<i>GALANTHUS nivalis</i> .....	...	sev. pl.	2 ab.	...
<i>ASPARAGUS officinalis</i> .....	...	...	1†	...
<i>CONVALLARIA majalis</i> .....	...	4	1	...
<i>POLYGONATUM verticillatum</i> .....	...	...	...	...
officinale.....	...	...	...	...
multiflorum.....	...	...	1 s.	...
<i>MAIANTHEMUM bifolium</i> .....	...	...	...	...
<i>RUSCUS aculeatus</i> .....	...	...	...	...
<i>TULIPA sylvestris</i> .....	...	2	1*	...
<i>LILIUM Martagon</i> .....	...	...	...	...
† <i>pyrenaicum</i> .....	...	1	...	...
<i>LLOYDIA serotina</i> .....	...	...	...	...
<i>FRITILLARIA meleagris</i> .....	...	...	...	...
<i>ORNITHOGALUM umbellatum</i> .....	...	4	3	...
pyrenaicum.....	...	1 s.	...	...
nutans.....	...	1	1	...
<i>GAGEA lutea</i> .....	...	...	1	...
<i>SCILLA autumnalis</i> .....	...	...	...	...
verna.....	...	...	...	...
bifolia.....	...	...	...	...
<i>ALLIUM Ampeloprasum</i> .....	...	...	...	...
Babingtonii.....	...	...	...	...
Scorodoprasum.....	...	...	...	...
vineale.....	plent.	plent.	m. pl.	...
sphaerocephalum.....	...	...	...	...
oleraceum.....	1	2	1	...
Schœnoprasum.....	...	...	...	...
ursinum.....	gen.	ab.	ab.	ab.
<i>SIMETHIS bicolor</i> .....	...	...	...	...
<i>ENDYMION nutans</i> .....	gen.	gen.	gen.	gen.
<i>MUSCARI racemosum</i> .....	...	...	...	...
<i>COLCHICUM autumnale</i> .....	ab.	ab.	ab.	m. pl.
<i>TOFIELDIA palustris</i> .....	...	...	...	...
<i>ERIOCAULON septangulare</i> .....	...	...	...	...
<i>NARTHECIUM ossifragum</i> .....	...	1	...	2
<i>JUNCUS maritimus</i> .....	...	...	...	...
acutus.....	...	...	...	...
effusus.....	gen.	gen.	gen.	gen.
conglomeratus.....	gen.	gen.	gen.	gen.
glaucus.....	gen.	gen.	gen.	gen.
diffusus.....	...	...	...	...
balticus.....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>JUNCUS</b> filiformis .....	...	...	...	...
castaneus .....	...	...	...	...
triglumis .....	...	...	...	...
biglumis .....	...	...	...	...
trifidus .....	...	...	...	...
obtusiflorus .....	1	...	1	...
acutiflorus .....	gen.	gen.	gen.	gen.
lamprocarpus .....	gen.	gen.	gen.	gen.
nigritellus .....	...	...	...	...
supinus (uliginosus) .....	r. u.	n. u.	r. u.	r. u.
squarrosus .....	n. u.	n. c.	n. u.	n. c.
compressus .....	...	1	n. u.	...
Gerardi .....	1	2	...	...
bufonius .....	gen.	gen.	gen.	gen.
<b>LUZULA</b> sylvatica .....	...	m. pl.	sev. pl.	n. c.
Forsteri .....	...	sev. pl.	sev. pl.	...
pilosa .....	gen.	gen.	gen.	gen.
campestris .....	ab.	ab.	ab.	ab.
multiflora .....	gen.	gen.	gen.	gen.
spicata .....	...	...	...	...
arcuata .....	...	...	...	...
<b>ALISMA</b> Plantago .....	gen.	gen.	gen.	gen.
ranunculoides .....	1*	...	...	...
natans .....	...	...	...	...
<b>ACTINOCARPUS</b> Damasonium .....	...	1	1	...
<b>SAGITTARIA</b> sagittifolia .....	plent.	sev. pl.	...	sev. pl.
<b>BUTOMUS</b> umbellatus .....	plent.	sev. pl.	r. u.	sev. pl.
<b>SCHEUCHZERIA</b> palustris .....	...	...	...	...
<b>TRIGLOCHIN</b> maritimum .....	...	...	...	...
palustre .....	3	sev. pl.	sev. pl.	sev. pl.
<b>TYPHA</b> latifolia .....	gen.	gen.	gen.	gen.
angustifolia .....	r. u.	m. pl.	sev. pl.	sev. pl.
<b>SPARGANIUM</b> ramosum .....	plent.	gen.	gen.	1
simplex .....	...	sev. pl.	m. pl.	1
natans .....	...	...	...	...
minimum .....	...	1	...	...
<b>ACORUS</b> Calamus .....	1	...	1	1 s.
<b>ARUM</b> maculatum .....	gen.	gen.	gen.	gen.
italicum .....	...	...	...	...
<b>LEMNA</b> trisulca .....	gen.	gen.	gen.	n. c.
minor .....	gen.	gen.	gen.	gen.
pol'yrhiza .....	...	sev. pl.	gen.	r. u.
gibba .....	1	m. pl.	sev. pl.	...
<b>POTAMOGETON</b> natans .....	gen.	gen.	gen.	gen.
oblongus .....	...	2	...	...
plantagineus .....	...	1	...	...
rufescens .....	...	1	...	1
lanceolatus .....	...	...	...	...
sparganiifolius .....	...	...	...	...
heterophyllus .....	...	...	1?	1

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
POTAMOGETAN lucens .....	n. u.	1 riv.	...	1 riv.
longifolius .....	...	...	...	...
prælongus .....	...	...	...	...
perfoliatus .....	gen.	gen.	gen.	1
crispus .....	gen.	gen.	gen.	n. u.
zosterifolius .....	...	2	...	...
acutifolius .....	...	...	...	...
gramineus .....	n. u.	sev. pl.	sev. pl.	r. u.
compressus .....	1	...	...	...
pusillus .....	...	1	...	...
trichoides .....	...	...	...	...
flabellatus .....	1	...	...	...
pectinatus .....	gen.	n. u.	n. u.	n. u.
filiformis .....	...	...	...	...
densus .....	2	...	...	...
RUPPIA maritima .....	...	...	...	...
rostellata .....	...	...	...	...
ZANNICHELLIA palustris .....	sev. pl.	n. u.	n. u.	...
ZOSTERA nana .....	...	...	...	...
marina .....	...	...	...	...
CYPERUS longus .....	...	...	...	...
fuscus .....	...	...	...	...
SCHENUS nigricans .....	1*	...	...	1*
CLADIUM Mariscus .....	1*	...	...	...
RHYNCHOSPORA alba .....	...	1	...	1
fusca .....	...	...	...	...
ELEOCHARIS palustris .....	gen.	gen.	gen.	gen.
uniglumis .....	...	...	...	...
multicaulis .....	...	...	1	...
acicularis .....	1	...	r. u.	v. u.
SCIRPUS maritimus .....	1*	1	1 ab.	...
sylvaticus .....	...	plent.	m. pl.	m. pl.
carinatus .....	...	1	1 s.	...
triqueter .....	...	...	...	...
lacustris .....	gen.	gen.	gen.	gen.
Tabernæmontani .....	...	1	...	...
cæspitosus .....	...	...	1	1
pauciflorus .....	...	1	1	1*
parvulus .....	...	...	...	...
fluitans .....	n. u.	n. u.	n. u.	r. u.
setaceus .....	1	n. u.	r. u.	r. u.
Savii .....	...	...	...	...
Holoschænus .....	1 P*	...	...	...
BLYSMUS compressus .....	2	...	r. u.	...
rufus .....	...	...	...	...
ERIOPHORUM vaginatum .....	...	...	...	1*
angustifolium .....	1	sev. pl.	sev. pl.	2
latifolium .....	...	1 ab.	2	...
gracile .....	...	...	1*	...
KOBERESSIA caricina .....	...	...	...	...

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<b>CAREX</b> dioica .....	...	...	...	...
Davalliana .....	...	...	...	...
pulicaris .....	...	1	sev. pl.	2
rupestris .....	...	...	...	...
pauciflora .....	...	...	...	...
intermedia .....	1	n. c.	n. c.	1
arenaria .....	...	...	...	...
incurva .....	...	...	...	...
divisa .....	...	...	...	...
vulpina .....	gen.	gen.	gen.	gen.
muricata .....	occ.	gen.	gen.	occ.
divulsa .....	gen.	gen.	gen.	r. u.
teretiuscula .....	...	...	...	1 ?
paradoxa .....	...	...	...	...
paniculata .....	...	m. pl.	1	sev. pl.
Boenninghausenia .....	...	...	...	...
axillaris .....	...	1	2	...
remota .....	gen.	gen.	gen.	gen.
stellulata .....	...	sev. pl.	sev. pl.	2
elongata .....	...	1	...	...
curta .....	...	2	...	...
vitilis .....	...	...	...	...
lagopina .....	...	...	...	...
ovalis .....	gen.	gen.	gen.	gen.
stricta .....	...	1	1	1
cæspitosa .....	...	...	...	...
acuta .....	gen.	gen.	gen.	gen.
rigida .....	...	...	...	...
aquatilis .....	...	...	...	...
vulgaris (cæspitosa, Sm.) ...	r. u.	n. u.	n. u.	n. u.
Vahlî .....	...	...	...	...
Buxbaumii .....	...	...	...	...
atrata .....	...	...	...	...
pallescens .....	r. u.	n. u.	n. u.	n. u.
panicea .....	gen.	gen.	gen.	gen.
vaginata .....	...	...	...	...
limosa .....	...	...	...	...
irrigua .....	...	...	...	...
rariiflora .....	...	...	...	...
capillaris .....	...	...	...	...
strigosa .....	...	n. u.	2	sev. pl.
pendula .....	gen.	gen.	gen.	gen.
humilis .....	...	...	...	...
digitata .....	...	1	...	...
præcox .....	gen.	gen.	gen.	gen.
ericetorum .....	...	...	...	...
montana .....	...	1	...	...
pilulifera .....	...	3	1	3
tomentosa .....	...	...	...	...
glaucia .....	gen.	gen.	gen.	gen.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
CAREX ustulata .....	...	...	...	...
flava .....	gen.	gen.	gen.	gen.
œderi .....	n. c.	n. c.	n. u.	sev. pl.
extensa .....	...	...	...	...
fulva .....	...	r. u.	r. u.	sev. pl.
punctata .....	...	...	...	...
distans .....	...	...	...	...
binervis .....	...	n. c.	r. u.	sev. pl.
lævigata .....	...	...	...	...
depauperata .....	...	...	...	...
sylvatica .....	gen.	gen.	gen.	gen.
Pseudo-Cyperus .....	...	n. u.	n. u.	r. u.
filiformis .....	...	...	...	...
hirta .....	gen.	gen.	gen.	gen.
pulla .....	...	...	...	...
Grahami .....	...	...	...	...
ampullacea .....	...	2	...	3
vesicaria .....	n. u.	n. u.	sev. pl.	2
paludosa .....	n. u.	n. u.	n. u.	n. u.
riparia .....	gen.	gen.	gen.	gen.
DIGITARIA humifusa .....	...	...	...	...
ECHINOCHLOA Crus-galli .....	...	...	...	...
†SETABIA viridis .....	...	2†	...	...
verticillata .....	...	...	...	...
glaucia .....	...	...	...	...
CYNODON Dactylon .....	...	...	...	...
SPARTINA stricta .....	...	...	...	...
alterniflora .....	...	...	...	...
KNAPPIA agrostidea .....	...	...	...	...
PHALARIS †Canariensis .....	occ.†	occ.†	occ.†	occ.†
paradoxa .....	...	...	...	...
arundinacea .....	gen.	gen.	gen.	gen.
ANTHROXANTHUM odoratum .....	gen.	gen.	gen.	gen.
HIEROCHLOE borealis .....	...	...	...	...
PHLEUM asperum .....	...	...	...	...
Boehmeri .....	...	...	...	...
arenarium .....	...	...	...	...
pratense .....	gen.	plent.	n. u.	n. u.
alpinum .....	...	...	...	...
ALOPECURUS pratensis .....	gen.	gen.	gen.	gen.
alpinus .....	...	...	...	...
geniculatus .....	gen.	gen.	gen.	gen.
fulvus .....	...	1	1	1
bulbosus .....	...	...	...	...
agrestis .....	plent.	plent.	plent.	r. u.
SESLERIA cœrulea .....	...	...	...	...
NARDUS stricta .....	...	n. u.	n. u.	n. u.
LEEESIA oryzoides .....	...	...	...	...
STIPA pennata .....	...	...	...	...
MILIUM effusum .....	sev. pl.	m. pl.	sev. pl.	sev. pl.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<i>PHRAGMITES communis</i> .....	plent.	m. pl.	m. pl.	...
<i>PSAMMA arenarea</i> .....	...	...	...	...
<i>CALAMAGROSTIS lanceolata</i> .....	...	...	...	...
<i>Epigejos</i> .....	3 ab.	m. pl.	sev. pl.	1
<i>stricta</i> .....	...	...	...	...
<i>APERA Spica-venti</i> .....	...	...	...	1
<i>interrupta</i> .....	...	...	...	...
<i>AGROSTIS setacea</i> .....	...	...	...	...
<i>canina</i> .....	gen.	gen.	gen.	gen.
<i>vulgaris</i> .....	gen.	gen.	gen.	gen.
<i>alba</i> .....	gen.	gen.	v. u.	r. u.
<i>LAGURUS ovatus</i> .....	...	...	...	...
<i>POLYPOGON monspeliensis</i> .....	...	...	...	...
<i>littoralis</i> .....	...	...	...	...
<i>GASTRIDIVM lendigerum</i> .....	...	2	...	...
<i>HOLCUS lanatus</i> .....	gen.	gen.	gen.	gen.
<i>mollis</i> .....	sev. pl.	m. pl.	m. pl.	sev. pl.
<i>CORYNEPHORUS canescens</i> .....	...	...	...	...
<i>AIRA cæspitosa</i> .....	gen.	gen.	gen.	gen.
<i>flexuosa</i> .....	gen.	gen.	gen.	gen.
<i>alpina</i> .....	...	...	...	...
<i>caryophyllea</i> .....	r. u.	var. loc.	n. c.	r. u.
<i>præcox</i> .....	1	n. u.	n. u.	r. u.
<i>TRisetum flavescens</i> .....	gen.	gen.	gen.	gen.
<i>AVENA fatua</i> .....	ar.	ar.	ar.	...
<i>strigosa</i> .....	...	...	...	...
<i>pratensis</i> .....	3 ab.	sev. pl.	1	...
<i>pubescens</i> .....	1	3	r. u.	...
<i>ARRHENATHERUM avenaccum</i> .....	gen.	gen.	gen.	gen.
<i>β. bulbosum</i> .....	gen.	gen.	gen.	gen.
<i>TRIODIA decumbens</i> .....	1	sev. pl.	sev. pl.	sev. pl.
<i>KÆLERIA cristata</i> .....	2	1	1	1*
<i>MELICA uniflora</i> .....	gen.	gen.	gen.	gen.
<i>nutans</i> .....	...	1 ab.	...	...
<i>MOLINIA cærulea</i> .....	...	m. pl.	1	3
<i>Poa annua</i> .....	gen.	gen.	gen.	gen.
<i>bulbosa</i> .....	...	...	...	...
<i>minor</i> .....	...	...	...	...
<i>laxa</i> .....	...	...	...	...
<i>alpina</i> .....	...	...	...	...
<i>cæsia</i> .....	...	...	...	...
<i>nemoralis</i> .....	...	n. u.	m. pl.	1
<i>Parnellii</i> .....	...	...	...	...
<i>Balfourii</i> .....	...	...	...	...
<i>trivialis</i> .....	gen.	gen.	gen.	gen.
<i>pratensis</i> .....	gen.	gen.	gen.	gen.
<i>compressa</i> .....	n. u.	n. u.	r. u.	...
<i>GLYCERIA aquatica</i> .....	sev. pl.	m. pl.	sev. pl.	m. pl.
<i>fluitans</i> .....	gen.	gen.	gen.	gen.
<i>plicata</i> .....	gen.	gen.	gen.	gen.



NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
GLYCEBIA pedicellata .....	1	...	...	...
SCLEEROCHLOA maritima .....	...	...	...	...
distant .....	1	1 ab.	...	...
Borreri .....	...	...	...	...
procumbens .....	...	...	...	...
rigida .....	r. u.	n. u.	n. u.	1
lohiacea .....	...	...	...	...
BEIZA minor .....	...	...	...	...
media .....	gen.	gen.	gen.	gen.
CATABROSA aquatica .....	plent.	plent.	sev. pl.	sev. pl.
CYNOSURUS cristatus .....	gen.	gen.	gen.	gen.
echinatus .....	...	...	...	...
DACTYLIS glomerata .....	gen.	gen.	gen.	gen.
FESTUCA uniglumis .....	1	...	...	...
bromoides .....	1	m. pl.	sev. pl.	...
ambigua .....	...	...	...	...
Myurus .....	1	gen.	gen.	...
ovina .....	n. u.	n. u.	n. u.	n. u.
rubra .....	...	...	...	...
sylvatica .....	...	1	...	...
gigantea .....	m. pl.	m. pl.	sev. pl.	2
arundinacea .....	...	...	...	...
pratensis and loliacea .....	gen.	gen.	gen.	gen.
β. elatior .....	n. u.	n. u.	n. u.	r. u.
BROMUS erectus .....	sev. pl.	calc.	plent.	2
asper .....	gen.	gen.	gen.	gen.
sterilis .....	gen.	gen.	gen.	gen.
diandrus .....	...	1*	...	...
maximus .....	...	...	...	...
SERRAFALCUS secalinus .....	1	1	1	1 ?
racemosus .....	1	n. u.	1	...
commutatus .....	sev. pl.	v. u.	v. u.	r. u.
mollis .....	gen.	gen.	gen.	gen.
arvensis .....	...	...	...	...
squarrosus .....	...	...	...	...
BRACHYPODIUM sylvaticum .....	n. u.	gen.	gen.	n. u.
pinnatum .....	sev. pl.	m. pl.	m. pl.	r. u.
TRITICUM caninum .....	gen.	gen.	gen.	sev. pl.
repens .....	gen.	gen.	gen.	gen.
pungens .....	...	...	...	...
acutum (laxum) .....	...	1	...	...
juncum .....	...	...	...	...
ELYMUS arenarius .....	...	...	...	...
geniculatus .....	...	...	...	...
HORDEUM sylvaticum .....	...	...	r. u.	...
pratense .....	n. u.	plent.	n. u.	r. u.
murinum .....	gen.	gen.	gen.	gen.
maritimum .....	...	...	...	...
LEPTURUS incurvatus .....	...	...	...	...
LOLIUM perenne .....	gen.	gen.	gen.	gen.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broma. Lickey.
<i>LOLIUM Italicum</i> .....	occ.†	sev. pl.†	occ.†	occ.†
<i>linicola</i> .....	...	...	...	...
<i>temulentum</i> .....	...	...	1	...
<i>EQUISETUM arvense</i> .....	gen.	gen.	gen.	gen.
<i>umbrosum</i> .....	...	...	...	...
<i>Telmateia</i> .....	n. u.	m. pl.	m. pl.	plent.
<i>sylvaticum</i> .....	1	2	2 ab.	m. pl.
<i>limosum</i> .....	n. c.	plent.	plent.	plent.
<i>palustre</i> .....	sev. pl.	m. pl.	sev. pl.	m. pl.
<i>hyemale</i> .....	...	2	1	2
<i>trachyodon</i> .....	...	...	...	...
<i>variegatum</i> .....	...	...	...	...
<i>ALLOSORUS crispus</i> .....	...	...	1	...
<i>POLYPODIUM vulgare</i> .....	gen.	var. loc.	gen.	gen.
<i>Phegopteris</i> .....	...	...	...	...
<i>Dryopteris</i> .....	...	2	2	1 ?
<i>calcareum</i> .....	1	...	...	...
<i>PSEUDATHYRIUM alpestre</i> .....	...	...	...	...
<i>flexile</i> .....	...	...	...	...
<i>WOODSIA ilvensis</i> .....	...	...	...	...
<i>hyperborea</i> .....	...	...	...	...
<i>LASTREA Thelypteris</i> .....	...	...	...	...
<i>Oreopteris</i> .....	...	r. u.	sev. pl.	sev. pl.
<i>Filix-mas</i> .....	gen.	gen.	gen.	gen.
<i>cristata</i> .....	...	...	...	...
<i>rigida</i> .....	...	...	...	...
<i>spinulosa (and vars.)</i> .....	r. u.	m. pl.	m. pl.	n. u.
<i>dilatata</i> .....	r. u.	gen.	gen.	gen.
<i>æmula (recurva)</i> .....	...	...	...	...
<i>POLYSTICHUM Lonchitis</i> .....	...	...	...	...
<i>aculeatum &amp; lobatum</i> .....	...	m. pl.	m. pl.	sev. pl.
<i>angulare</i> .....	...	gen.	gen.	gen.
<i>CYSTOPTERIS fragilis</i> .....	1	1	...	2
<i>dentata</i> .....	...	...	...	...
<i>alpina</i> .....	...	...	...	...
<i>montana</i> .....	...	...	...	...
<i>ATHYRIUM Filix-fœmina</i> .....	gen.	gen.	gen.	gen.
<i>rheticum</i> .....	...	...	sev. pl.	...
<i>ASPLENIUM fontanum</i> .....	...	...	...	...
<i>lanceolatum</i> .....	...	...	...	...
<i>Adiantum-Nigrum</i> .....	gen.	var. loc.	gen.	n. c.
<i>Trichomanes</i> .....	1 ab.	gen.	gen.	v. u.
<i>viride</i> .....	...	...	1*	...
<i>marinum</i> .....	...	...	...	...
<i>Ruta-muraria</i> .....	ab.	gen.	gen.	gen.
<i>germanicum</i> .....	...	...	...	...
<i>septentrionale</i> .....	...	...	...	...
<i>SCOLOPENDRIUM vulgare</i> .....	gen.	gen.	gen.	sev. pl.
<i>CETERACH officinarum</i> .....	1	3	3	1
<i>BLECHNUM boreale</i> .....	...	m. pl.	m. pl.	2 ab.

NAMES OF PLANTS.	Avon.	Severn.	Malvern and Teme.	Broms. Lickey.
<i>PTERIS</i> aquilina .....	gen.	gen.	gen.	gen.
<i>ADIANTUM</i> Capillus-Veneris .....	...	...	...	...
<i>TRICHOMANES</i> radicans .....	...	...	...	...
<i>HYMENOPHYLLUM</i> tunbridgense ..	...	...	...	...
<i>Wilsoni</i> .....	...	...	...	...
<i>OSMUNDA</i> regalis .....	...	2	...	1
<i>BOTRYCHIUM</i> Lunaria .....	1	3	2	1
<i>OPHIOGLOSSUM</i> vulgatum .....	sev. pl.	m. pl.	4	sev. pl.
<i>PILULARIA</i> globulifera .....	...	...	...	...
<i>ISOETES</i> lacustris .....	...	...	...	...
<i>echinospora</i> .....	...	...	...	...
<i>hystrix</i> .....	...	...	...	...
<i>LYCOPODIUM</i> clavatum .....	...	3	...	2
<i>annotinum</i> .....	...	...	...	...
<i>alpinum</i> .....	...	1*	...	...
<i>Selago</i> .....	...	...	...	1
<i>inundatum</i> .....	...	1 ab.	...	...
<i>selaginoides</i> .....	...	...	...	...
<i>CHARA</i> flexilis .....	1	1	1	...
<i>syncarpa</i> .....	...	...	...	...
<i>translucens</i> .....	...	...	...	...
<i>mucronata</i> .....	...	...	...	...
<i>gracilis</i> .....	...	...	...	...
<i>tenuissima</i> .....	...	...	...	...
<i>Smithii</i> .....	...	...	...	...
<i>prolifera</i> .....	...	...	...	...
<i>Borreri</i> .....	...	...	...	...
<i>polysperma</i> .....	...	...	...	...
<i>crinita</i> .....	...	...	...	...
<i>vulgaris</i> .....	...	sev. pl.	sev. pl.	...
<i>hispida</i> .....	...	...	1	...
<i>tomentosa</i> .....	1*	...	...	...
<i>aspera</i> .....	...	...	1	...
<i>fragilis</i> .....	...	...	1	...

N.B.—In the above Catalogue of Plants the ? has been only inserted, where the plant had not been determined with *absolute certainty*, as with *Scrophularia Ehrarti*, and a very few others. Mr. T. Westcombe considers the *queried Calamintha sylvatica*, Bromfield, found at Abberley, to be truly *C. grandiflora*, and of course an introduction at the locality. The name in *italics* denotes the *certainty* of planting or colonization.

## APPENDIX.

### WORCESTERSHIRE RUBI.

(BRAMBLES.)

Opinions vary so much among botanists as to the species or quasi-species of fruticose Rubi, that I have judged it best to place the arrangement of them separately, only allowing *R. Idaus*, *suberectus*, *casius*, and *discolor*, in the tabulated list (according to the views of those who would agree with Hooker and Arnott), though taking a much wider range myself, and not believing that the various forms about to be mentioned can possibly be all referable to, or derivable from, *R. casius* and *fruticosus* (the old name of authors). Those, therefore, who agree with me in this, can add the number of fruticose Rubi here named to the before-mentioned amount of Worcestershire plants contained in the census.

Sir James Smith, Dr. Lindley, the Rev. W. A. Leighton, Professor Babington, Dr. Bell Salter, and the Rev. A. Bloxam, among other British botanists, have favoured the extension of the species of fruticose Rubi, and I have attended to the subject myself for many years, so that I have had ample time for observation and consideration. In 1847 I furnished Dr. Steele, of Dublin, with the arrangement of the British Fruticose Rubi, which he has inserted in his "Handbook of Field Botany" (pp. 53-61), though some corrections are now necessary in the names of that list; the general divisions, however, remaining the same. Mr. E. Newman copied my descriptions of the Malvern Brambles into the *Phytologist* (vol. iv., pp. 807-825), and in the following number of the same work I described the other British species not found about the Malvern Hills. Professor Babington, in his "Manual of British Botany," has attended critically to the subject, and has introduced many new forms, all of which I am not fully acquainted with. Though agreeing with Mr. Babington generally, I cannot coincide with him in all cases,\* but must rely on my own observations.

In distinguishing the quasi-species of Rubi, and adjusting their varieties, very great care is necessary, and individual plants, however, luxuriant, are not to be considered as distinct without careful study. The normal form of a bramble is generally in a repent condition, and

\* Alterations in names occur in every new edition of the *Manual*; and varieties particularly mentioned at one time, disappear, without the reasons which have induced change in nomenclature and rank being stated. This is inconvenient to the student.

when supported it assumes a very different aspect, though intermediate forms may be traced. Thus, *R. cæsius*, though generally trailing, becomes, when supported, very different in appearance, sporting in fact into *R. nemorosus* (Hayne), and *R. dumetorum* of W. and N. One of its varieties, indeed, "pseudo-Idæus," has a perfectly erect barren stem, though repent shoots issue from it. So *R. Schlectendalii* of W. and N. is truly only a dilated form of my *R. amplificatus*. In bogs, too, I have often remarked *R. suberectus* quite prostrate, while in the form I have described in Dr. Steele's "Handbook" as *R. umbrosus*, it makes a handsome, tall, and perfectly erect bushy shrub. In like manner the prostrate *R. Sprengelii* is the normal form in mountain thickets, while *R. Borreri* is the erect variety on lower ground, so that Mr. Babington's remark that "*R. Sprengelii* is a small form of *R. Borreri*," should rather be that *Borreri* is an erect form of *R. Sprengelii*. This observation should be kept in view, and thus correcting myself, I must now assign the paniculate *R. thyrsoiflorus* I described in Dr. Steele's work, as *β. Guntheri*.

Nothing can be more variable than the *foliage* of brambles, even in the same species, so that no positive reliance ought to be placed upon the form of the leaves. Even in the common *fruticosus* or *discolor*, the characteristic silvery-white leaves beneath become green in the shade, as is also the case with *R. vestitus* of W. and N. Variability of form occurs on the very same bush, where as in *R. Bellardi*, a quinate leaf will sport beside a ternate or quaternate one, and in luxuriant specimens of any form there is always a tendency to dilatation in the central leaflet. Thus the generally quinate leaves of *R. suberectus* and its affinities are perpetually becoming *septenate*, or at least with an accessory leaflet at the base of the central one, and the curious form of *cæsius* called *pseudo-Idæus* has its leaves pinnated like the Raspberry. Lacinated forms of *discolor*, *rudis*, or other species too, sometimes are met with where *every leaflet* is so deeply cut to its base as to be three-lobed, and each lobe pinnatifid. Varieties with very narrow leaflets, or with the central one with a longer or shorter petiole than common, are far from unusual. So luxuriant plants have always a tendency to produce exuberant foliage, but the panicles of such bushes seldom produce proportionate sized panicles.

Brambles were formerly all considered as biennial shrubs, but only the *Idæi* are strictly so, the fruticose Rubi being all sub-perennial, and existing an indefinite time.\* Thus it is that a bush will go on extending

\* The sub-erect brambles, as their shoots do not root, are mostly biennial like the Raspberry, though frequently continuing alive a third year. Observation shows the fruticose brambles as existing and extending for several years successively. This I mentioned long since in the Transactions of the Edinburgh Botanical Society.

itself by its runners till a considerable thicket is formed, but the vital principle being at last exhausted, death occurs throughout the complicated system of branches, and then a wide space of withered stems is strangely seen filling extensive spaces in woods. Numerous seedlings are produced every year, and disseminated in all directions; old pollard willows and hawthorns having often an exuberant growth of brambles upon them.

The fruticose *Rubi* may be considered as lovers of temperate regions and low situations, and in this country do not flourish very high upon the mountains, becoming quite dwarf at 2,000 ft. of elevation, at which height I have only observed *R. suberectus*. The other brambles that rise to about 1,000 ft. are *R. scaber*, *R. Sprengelii*, *R. carpinifolius*, and *R. cæsius*. The common *discolor* grows on the sea-coast within reach of the tidal spray, but does not rise to the altitude of those mentioned, and becomes comparatively rare in the north of England. *R. suberectus* and its varieties prefer moist and boggy localities, and many forms are restricted to forest shades, where they extend themselves most luxuriantly, and often assume a gigantic port. Ripe blackberries are now generally brought to market, almost the only native fruit that poor people can gather unmolested.

#### A. Fruticose Brambles. Biennial or sub-perennial.

##### i. RUBI CÆSII.—CÆSIOUS BRAMBLES.

1.—*R. cæsius*, Linn.\*—General in its normal creeping form as affecting low moist situations, and up to 1,000 ft. on the oölitic escarpment of the Cotteswolds. Numerous varieties occur, the most curious of which are my "nudatus" (Steele's Handbook, p. 54), without setæ or glands; and the "pseudo-Idæus" of W. and N., which bears considerable resemblance to the Raspberry, and occurs in a copse at Rushwick, near Worcester. *R. cæsius* is rare or absent from the country around Kidderminster according to the observations of my friend, Mr. W. Mathews, jun. On the side of the railway cutting near Defford, south of Worcester, it has appeared profusely.

2.—*R. nemorosus*, Hayne.—This is more hairy and setose than *cæsius* commonly is, though some varieties can scarcely be distinguished from it. *R. dumetorum* of W. and N. (Rub. Germ.) is a synonym. In the fifth edition of his "Manual of British Botany,"

\* For detailed descriptions see Steele's "Handbook of Field Botany," or Prof. Babington's "Manual of British Botany." Also in the Phytologist, vol. iv., pp. 817-825, and 917-922. In "English Botany" are many figures of brambles, but the best representations are in the "Rubi Germanici" of Dr. Weihe and Nees von Esenbeck.

Professor Babington has introduced "*R. althæifolius*, Host," in the place of *R. nemorosus*, thus implying the older authority of the former name, but giving no explanation of the matter. No doubt many anomalous forms have been referred to *R. nemorosus*, and the change of name does not remove the difficulty of allocation.

2. *ferox*.—This very rough and glandulose variety has been recently elevated into a species by Professor Babington, under the name of *R. tuberculatus*; but I think it too closely connected with the type, and there are varying intermediate states. Abundant near Worcester in hedges, and by the road sides around Halesowen, in the northern part of the county, where it occurs in extreme profusion.

3.—*R. sublustris*, Lees. (*R. corylifolius*, Smith).—Very general throughout Worcestershire. One remarkable variety that I have named "*cœnosus*" has its stem and panicle very white with close down, studded with white glands, and the prickles themselves hairy. This occurs near Worcester. Several other varieties might be named, and occasionally the leaves are very large. "*R. Wahlbergii*, Arrhen." is now referred to *corylifolius* by Mr. Babington, as var. *γ. purpureus*. Mr. Babington makes my *sublustris* the *α.* of *corylifolius*. There are, indeed, many varieties, and as the "*corylifolius*" of Sir James Smith included many indefinite forms, I think his name objectionable on that account.

4.—*R. tenui-armatus*, Lees. (See Phytologist for February, 1853, p. 818).—This is distinguished by its sparingly setose stem and very weak prickles, which renders it easily known wherever it occurs. The *R. Balfourianus* of my friend Bloxam, appears to be a dilated form of this, but is comparatively rare in that state. The normal form as I have described it in my "*Botany of the Malvern Hills*," is very widely diffused, and as there remarked—this species "*approaches some varieties of R. dumetorum*, but may always be distinguished by its weak prickles that are broken at the slightest touch, its involute sepals, and scattered leafy panicle." It is a general bramble, the blueish fruit showing its affinity to *R. cœsius*, while its glandulosity though in a lesser way connects it with the glandular Rubi. This form was named erroneously "*R. Schleicheri*, W. and N.," in Steele's Handbook; but whether my name remains or not, the form itself is abundantly dispersed, and (if carefully observed) not to be confounded with anything else.

## ii. RUBI GLANDULOSI.—GLANDULAR BRAMBLES.

5.—*R. Güntheri*, W. and N.—This is a woodland and rather local bramble, with a long narrow panicle; but in a very dilated state as in Devonshire, it assumes the appearance of *R. thyrsiflorus*, W. and N.,

which in Steele's Handbook I considered it. The typical form grows in Wyre Forest; in the Sapey Brook glen; Little Storage Wood; at Clifton-on-Teme; also in woods at Abberley, Shrawley Wood, and Crows-nest Wood, near Worcester. Found in woods from Yorkshire to Devon.

6.—*R. Menkii*, W. and N.—The type is a prostrate bramble as described in Phytologist (vol. iv., p. 920), but as I have noted may be traced to the beautiful variety called "*pyramidalis*" by Professor Babington. The latter agrees in all respects with the type, but has a remarkably elongated pyramidal panicle, whose long-stalked branches almost parallel with the stem, and purple-cinereous aspect, distinguish it from every other bramble. In Shrawley Wood, and Wyre Forest, rare. (The var. *pyramidalis*, also in North Wales.)

7.—*R. Bellardi*, W. and N. (*R. glandulosus*, Bellard.)—This is a well-marked glandulose bramble, and its variety *R. Lejeunei* is a really beautiful bramble. Mr. Babington refers *R. fuscus* here, which if correct may be considered the thyrsifloral form of the shrub, having very large leaves. *R. dentatus*, Blox., and perhaps other forms and "fusco-aters" may also shelter here. This is a local species fond of hilly places, where it forms extensive thickets. The type is abundant in Rough Hill Wood, north of the Malvern chain, and in Coldridge Wood, Shatterford. The varieties are found in Bewdley Forest, Cowleigh Park, Colwall Woods, Abberley, near Halesowen, &c. The Wyre Forest form of *R. Lejeunei* has a closely setose bloomy stem quite peculiar and very beautiful, as well as attractive. The panicle of *R. Bellardi*, although flexuose and leafy, with racemose branches at the base, seldom spreads out much, though its branches are often very crowded; but in *Lejeunii* the flexuose panicle has its lower branches so widely extended that the weight often causes the whole to be nutant and even prostrate without support. Sepals more elongated, with a tendency to be reflex in fruit.

8.—*R. hirtus*, W. and N.—This is a very hairy form, the hairs extending beyond the setæ, and the peduncles and calyces shaggy with long hairs concealing setæ. A variety of this from the thick-set prickles on the calyx may well be called *horridus*. A canescent variety named "candicans" by Mr. Babington, occupies the northern side of the Priory Grove, Little Malvern. Altogether a forest bramble. I incline to refer *R. foliosus*, Weihe, here as a variety.

9.—*R. humifusus*, Weihe.—This "arcuate-prostrate" bramble, with its hairy stem covered with setæ and slender aciculi, comes very near to *R. hirtus*, and, like that, is a local and woodland species. The prickles both of the stem and the panicle are long and sharp, slender as needles, and quite peculiar. In thick woods, rare.



10.—*R. mucronulatus*, Boreau. (*R. mucronatus*, Blox.)—This is a local bramble, which has received various names, and I formerly described it rather doubtfully as *R. lingua*, W. and N. Both my friend, the Rev. A. Bloxam, and Professor Babington place it among hairy brambles, but it appears to me decidedly *glandular*. It is green, weak, and attenuated from growing in the shade. Its abruptly cuspidate leaflets are characteristic. Confined to forest ground.

11.—*R. pallidus*, W. and N.—This widely-distributed glandular bramble is well marked by its obovate-elliptical and acuminate leaflets and almost simple panicle. As I have before observed (Phytol., vol. iv., p. 819)—“*Pallidus* is a most variable plant in woods, often very attenuated and trailing, but always marked by its elliptical leaflets; the flowers are frequently a bright mottled red, as are those of *R. hystrix*, and it appears to me that there is little difference between them, or rather a complete graduation from one to the other.” Abundant upon woodland ground, both the type and *β. hystrix*, and occupying the same thickets. Plentiful in the Croft Woods and Cowleigh Park, Malvern; Wyre Forest; Coldridge Wood, near Shatterford, &c. Also in Tiddesley Wood, in the Avon division. My *rosaceus* has been referred here by Mr. Babington (3rd Edit., Man.) In his last edition *R. pallidus* is made a variety of *R. Köhleri*; but in this I cannot concur, having observed it so often on the sylvan banks it delights to cover with a tangled growth.

12.—*R. Bloxamii*, Lees. (See Steele's Handbook, p. 55.)—As I have observed, “the very distant lower corymbose branches of the panicle in *Bloxamii*, and its far more rigid thorny aspect, distinguish this from the thyrsiflorous form of *R. Guntheri*.” Professor Babington acknowledges this species as good, but it is rare, and I have only observed it on the borders of Wyre Forest, and in Warwickshire, where it was detected by my observant friend, the Rev. Andrew Bloxam.

13.—*R. Köhleri*, W. and N.—Stem densely armed with unequal straight prickles, passing into aciculi; leaves quinate, with elliptical sharply serrate leaflets, closely hairy beneath; panicle long, narrow, very prickly, and setose. This is a common and well-marked bramble, and need be confounded with no other. It generally, however, grows solitary, not forming dense thickets, though widely distributed through the country. Lindley's “*echinatus*” only differs in its more leafy panicle.

14.—*R. fusco-ater*, Weihe.—This is a variable and critical bramble which few botanists appear to understand, and is much confounded in herbaria. I cannot very well exclude it, though unable to state anything very characteristic that may distinguish it except its *stem*, *gristly*

with hairs, and I think it would be an advantage to unite it with *R. hirtus*. Doubtful forms of glandular brambles are too frequently referred to "fusco-ater" as the most likely deposit for them.

15.—*R. scaber*, W. and N.—Stem angular, not hairy, but horrent with falcate prickles intermixed with innumerable short setæ and aciculi, all having red verrucose bases dispersed on all sides; leaves ternate or pedate, smooth beneath, leaflets obovate, crisped, and wavy at the margin, deeply cut, their mid-ribs fringed with small prickles; panicle long, spreading, sub-racemose; lower branches distant, leafy, upper ones closer; peduncles hairy, densely prickly, and closely setose; sepals woolly and thorny, loosely reflex in flower and fruit. This is an excessively prickly bramble, but rather rare. At the Old Storage between Malvern and Alfrick, and in a wood at Abberley. A pretty dwarf form occurs on the Rowley Hills. (This species is easily known, and affects sub-alpine localities.) Plentiful in North Wales.

β. *verruosus*, Lees.—Stem densely armed with yellow prickles, whose bases are distended into each other, stiff with hairs and innumerable setæ; panicle with numerous axillary branches, nutant in fruit; peduncles and sepals densely hairy and setose, crowded with acute falcate prickles. In profusion on Bromsgrove Lickey to above 900 feet altitude, and mixed with no other bramble. This variety, which is very beautiful when its unexpanded flowers look like little red roses, is more closely and densely armed than any other British bramble I have met with, the enormously distended bases of the prickles having setæ upon them, and the entire panicle excessively thorny.

16.—*R. rudis*, W. and N.—This is a well-marked bramble, and its sharply incised leaflets render it easily known. Widely diffused in thickets. Mr. W. Mathews, jun., tells me it is very common about Kidderminster, and I have found it generally dispersed over the county and throughout England.

17.—*R. Radula*, W. and N.—Stem hispid, with numerous nearly equal setæ and few aciculi, above which the prickles stand very distinct and unconnected. A fine straggling thicket bramble, and variable in aspect, according to exposure, but differing from the general mass of glandulose Rubi, by the fringe of setæ and aciculi on its barren stem not graduating into prickles, and the latter not ranging very close together.

β. *Leightonii* (*R. Leightonii*, Lees, in Leighton's Flora of Shropshire), has a peculiar aspect with its greyish leaflets and nearly equal prickles, and might, I think, maintain specific rank as well as the dubious "fusco-ater." The type occurs plentifully about Offmoor, near Halesowen; at Broadwaters, near Kidderminster; and other bushy places. The var. *Leightonii* is local.

## iii. RUBI VILLOSI.—HAIRY BRAMBLES.

18.—*R. villicaulis*, W. and N.—Stem covered with dense white hairs, and the quinate leaves densely ciliated with stiff hairs beneath. One of the most elegant of British brambles, if contemplated just before the expansion of the flowers. Rather uncommon. Rough Wood Dingle, near Cowleigh Park, and woods at Alfrick; also near Broadheath, and in Wyre Forest. (*R. sylvaticus*, W. and N., is now omitted, as comprised in this.)

19.—*R. pampinosus*, Lees.—Stem angular, polished, with only short inconspicuous hairs, armed with many small declining prickles at the base, longer higher up the stem; leaves large, thin, and flexible, with scattered ciliated hairs on the veins beneath, lower leaflets seated on the intermediate, central one ovate or cordate-ovate, with coarse serratures; rachis with dense fringe of spreading hairs; panicle very long, with paniculate lower branches, shortening, but spreading out wider as they ascend in a thyrsiform manner, and with ternate axillary leaves nearly to the summit; sepals densely hairy, with scattered prickles, loosely reflex in flower and fruit. A very remarkable Worcestershire bramble, with leaves so large and numerous as almost to conceal the stem. Its leaves are almost naked, green on both sides, and its enormously lengthened wide-spreading panicle, whose upper branches are nutant in fruit, give it claims to correct discrimination. In dense thickets in Cowleigh Parh, near Malvern; and in Wyre Forest.

20.—*R. leucostachys*, Smith.—This in its various protean forms is general throughout the county, as well as England and Wales. It is easily known in its more hairy state of *vestitus* (*R. vestitus*, W. & N.), which is common in woods; but when the stem becomes denuded it is made out with difficulty, and many puzzling varieties could be enumerated. "*R. Grabowskii*" might probably be placed among them. "*R. Leightonianus*" (*Bab.*) is identical with *vestitus* according to Mr. Leighton himself. This is chiefly a thicket bramble, and in its very hairy and woolly state as *β. vestitus* is readily recognizable. The *vestitus* form is common in the woods about Malvern and the Abberley Hills, and I have noticed it as abundant at Horsley Bank, near Kidderminster.

21.—*R. calvatus*, Bloxam. (See Phytol., iv., p. 924.)—This is a large remarkably savage-looking and strong bramble, whose stem becomes in age quite denuded, and the leaves are singularly bare (whence the name), a few scattered hairs only being scarcely discernible on the veins and ribs beneath. The central leaflet is often exactly ovate, and very regularly but deeply apiculate-dentate, gradually acuminate; panicle very long, with rough, hairy, and closely prickly

branches, leafy throughout, and frequently widely divaricated at the summit. I first became acquainted with this bramble at Twycross, Leicestershire, in company with my friend, the Rev. Andrew Bloxam, who has attentively studied the Rubi. I have since found *R. calvatus* in Wyre Forest. It is plentiful in Caernarvonshire and southward to Dorset. Mr. Babington unites this to his *R. Salteri*, with which I am not well acquainted; but if, as he says, they prove to be "extremes of one species," and *R. Salteri* is the normal form, *calvatus* must be reduced to a variety.

#### iv. RUBI PILOSI.—PILOSE BRAMBLES.

22.—*R. carpinifolius*, W. and N.—The quinate glaucous-green leaves, pubescent beneath, and the central leaflet obtusely wedge-shaped with a long cusp, sufficiently distinguish the hornbeam-leaved bramble, which rather affects high situations. On Wannerton Downs, Bisshill, Hodge Hill, and at Broadwaters, all near Kidderminster, Mr. W. Mathews, jun. In woods at the western base of the Malvern Hills.

23.—*R. Sprengelii*, W. and N., and *β. Borreri*, Bell Salt.—This is, perhaps, the most beautiful of the British Rubi, delighting in shady upland woods, often among *Vaccinium Myrtillus*, where the barren stem trails upon the ground, throwing up numerous alternate flowering shoots, densely covered with weak but long and spreading white hairs; yet the plant is scarcely evident to the view until the small, but very deep red flowers are unfolded. This is the normal form, but the var. *Borreri* is taller and stouter, and much more prickly, with a widely spreading corymbose panicle. On Bromsgrove Lickey at about 900 ft. altitude. Also in woods at Moseley, and near Redditch, both type and variety. Very local.

24.—*R. amplifolius*, Lees; *β. Schlechtendalii*, W. and N.—Stem decumbent very long, with scattered hairs and deflexed prickles; leaves quinate, the leaflets elliptical, central one with a long cusp; panicle variable in length, often narrow or short, hairy, leafy below, the branches short and few-flowered above. This occurs generally in woods throughout England, and appears to me different from *R. macrophyllus* of Rub. Germ. (t. xii.) to which Professor Babington has referred it. *R. Schlechtendalii*, W. and N., is certainly the same as my plant, but with a wider developed panicle, and monstrous foliage. A singular bush of this form has existed in Cowleigh Park, Malvern, to my knowledge above thirty years, having enormously developed panicles, with very paniculate branches. This shrub extends itself proliferously by annual shoots (not rooting) proceeding from the axils of the leaves.

25.—*R. macrophyllus*, W. and N.—This, as described and figured in the *Rubi Germanici*, is certainly not of common occurrence in this

country, and is much more hairy than my *amplificatus*, and with larger and broader leaves, the ribs and veins covered with long hairs beneath. In Devonshire it attains a gigantic size. This form I have only found in Worcestershire in thickets in the upper part of Cowleigh Park, Malvern; while almost every wood nourishes the ordinary form of *R. amplificatus*, which is at once determinable, and its barren stem is often excessively elongated.

V. RUBI CANDICANTES.—HOARY WHITE-LEAVED BRAMBLES.

26.—*R. discolor*, W. and N. (*R. fruticosus*, auct.)—This is the old well-known common bramble, with hoary panicles and leaves white beneath, general in almost every hedge and waste spot, and often an epiphyte on old willows. Prickles strong and hooked.

27.—*R. argenteus*, W. and N.—Stem closely tomentose, and leaves very silvery beneath. Sepals densely tomentose. Not common. Hedges near Cotheridge, and towards the southern end of the Malvern Hills. More elegant in aspect than the preceding.

28.—*R. thyrsoides*, Wimm.—Panicle long, thyrsoid, with numerous axillary branches, distant below, gradually shorter, and very crowded at the summit; peduncles shaggy with hairs, armed with falcate prickles; calyces tomentose, tawny, loosely reflex in fruit. Wyre Forest, and Seckley Wood, near Bewdley. Rather rare. *β. macroacanthus*. Panicle pyramidal, with numerous many-flowered corymbose branches clothed with stiff white hairs. The plants of this section are all closely related, and not perhaps always easily distinguished from each other. The leaves of the first are rarely curiously inciso-serrate and even pinnatifid. The var. *macroacanthus* in Rough Hill Wood, Cowleigh, near Malvern.

VI. RUBI NITIDI.—SMOOTH-STEMMED BRAMBLES.

29.—*R. Lindleianus*, Lees. (*R. nitidus*, Bell-Salt and Bab., not of W. and N.)—Stem polished, with only a few scattered hairs; leaflets elliptical, jaggedly serrate, plicate at the edges; panicle long, with numerous branches, mostly spreading at right angles to the stem, densely crowded, compound and thorny, clothed with unequal hairs. Generally distributed in hedges and thickets, chiefly in low places. Common about Kidderminster. Mr. W. Mathews jun. A widely dispersed form over England and Wales. *R. Lind.* in Bab., 5th Ed.

30.—*R. rhamnifolius*, W. and N. (and *R. cordifolius*, W. and N.)—This is a very common and generally well-marked thicket bramble, though the leaves are variable both in size and outline, but frequently they are exactly heart-shaped. The central leaflet, in woods, is often

thrown out on a singularly elongated foot-stalk, but this is a mere sport of growth. Well distinguished by its smooth barren stem, and closely downy extra-foliaceous panicle. Fruit generally fine and well-produced. I noticed in Steele's "Handbook of Field Botany" a var. *β. blanditus*, which is the thyrsifloral form of this species, with long leafy panicle, and leaves very large and velvety beneath. The Rev. F. J. A. Hort has described a "*Rubus imbricatus*," which is adopted by Babington, though I think not essentially distinct from *R. rhamnifolius*.

31.—*R. incurvatus*, Bab.—Stem slightly clothed with scattered hairs, and rather belonging to the villose section, but placed next to *R. rhamnifolius* by Professor Babington. This has a peculiar aspect, its leaflets with incurved wavy edges, and a long, narrow, crowded, and hairy panicle. Rare. Thickets between Cowleigh and Worcester. Not uncommon in Wales.

32.—*R. affinis*, W. and N.—Stem sub-erect, finally arching, smooth and polished, with yellow declining prickles, seldom rooting; leaves quinate, the leaflets stalked and plicate, shining above, pale green beneath, irregularly dentate, central one cordate-ovate, with a long curved cusp; panicle short and broad at the summit, with two or three distant axillary branches below, hairy and densely prickly. Forming thickets in waste places, but not a hedge bramble. Below Malvern Wells, and about Kidderminster and Bewdley. Also near St. Kenelm's, and at Offmore Wood, near Hales Owen. Between Hall's Barn and Grey Green, Abberley Valley. (My *R. lentiginosus* referred here by Professor Babington I still consider distinct, and confined to sub-alpine places.)

#### vii. RUBI SUBERECTI.—SUBERECT BRAMBLES.

33.—*R. suberectus*, And.—This is a well-distinguished species, the barren shoots never rooting, and it is quite green and smooth. Fruit not generally perfected. Lindley's *R. fissus* is but a more prickly and hairy variety. Hartlebury Common, Moseley, Bromsgrove Lickey, and wood near Headless Cross. Sparingly in Huroott Wood, and on the side of a pool between Blakedown and Wannerton Downs, near Kidderminster. *Mr. W. Mathews, jun.* Not in the Malvern or Avon Divisions. Partial to wet spots, and abundant in Wales.

34.—*R. plicatus*, W. and N.—A larger and coarser plant in general than *R. suberectus*, but it must be confessed that intermediate forms occur. This grows very lofty, forming a tall shrub, the stem rising in thick woods in a sub-erect manner, and it often remains without any support the second year, in this case throwing out short bunches of flowering shoots from the summit, after the manner of the raspberry; but when the stem declines to the ground, the panicle becomes longer,

and the lower branches distant; the floral leaves are often very large, ternate below, cordate above, and frequently rising above the panicle. The calyx is but loosely reflex, and its pilose sepals often even invest the ripe fruit, which is red for a time, finally black. In moist thickets below Moorall's Well, and other spots at the western base of the Malvern Hills; at Birchen Grove, near Worcester; also between Kidderminster and Hodge Hill. *Mr. W. Mathews, jun.* On the Lower Lickey Range, at about 800 feet. Not common, and preferring shady forest spots.

#### viii. RUBI IDÆI.—RASPBERRIES.

35.—*R. Idæus*, Linn.—The Raspberry so well known in its ordinary state by its pinnate foliage, white beneath, is general over the county, but in some woody spots it is particularly abundant, as on the Lower Bromsgrove Lickey, and in Witley Park, &c. It is probably disseminated by birds, as it appears in new localities every year, and is often an epiphyte on old pollarded trees. The stem is generally pruinose and smooth, but sometimes it occurs rough with tawny setaceous prickles. The Raspberry is very common on the borders of pools in the vicinity of Kidderminster; also in Shrawley Wood, as well as numerous other places. But no varieties deserving designation have occurred in Worcestershire.

#### *B. Stem herbaceous.*

*R. saxatilis*, Linn.—Stone Bramble. The well-marked stone-bramble only occurs in Wyre Forest, as far as observed by our Worcestershire botanists, and it seems remarkable that it should be so limited, for it grows rather plentifully in woods among the Cotteswold Hills, near Cheltenham, at from 700 to 800 ft. altitude, where it fruits well. I have not observed ripe fruit in Wyre Forest. It might have been expected to appear in some of the woods on the western declivity of the Malvern Hills, but is not met with there, nor is it found in Herefordshire.

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The *Cryptogamia* are not included in this enumeration of Worcestershire Plants; but they may be subsequently catalogued as a supplement. There are, indeed, ample materials, for Dr. H. B. Holl has been indefatigable in his collection and examination of LICHENS; and Dr. Fraser and myself have made many additions to the MOSSES recorded as growing about the Malvern Hills.

## ADDITIONS AND CORRECTIONS.

At p. xci. the name of MR. J. S. HAYWOOD should be added as a member of the Club, whose constant attention to the localities of Worcestershire Plants merits recognition as having added to the numerous stations referred to in the tabulated list. His correct eye glances beyond professional duties, and he has communicated valuable information. MR. GEORGE REECE, the assiduous Curator of the Worcestershire Natural History Society, may also be named as having carefully arranged the Herbarium of native plants at the Museum under his charge, and given facilities for its examination.

The following recently-observed stations of remarkable plants deserve record, and members will do well to note any changes in the localities of plants, or mark fresh acquisitions that may fall under their notice :—

*Ranunculus lingua*.—This yet exists near a little pool at Spetchley, where it was found by a boy in the College School and taken to Mr. Barter, who recognized it, and Mr. T. Westcombe afterwards gathered the plant at the spot indicated.

*Papaver Lecoqii*.—This poppy, distinguished chiefly by its copious dark yellow juice, I have found growing on the top of an old limestone wall near the Berrow Church, in the Malvern division, this present summer (1867).

*Erysimum cheiranthoides*.—This was gathered in the vicinity of Stone, within the Severn Valley division, in the Club Excursion to Hagley, July, 1867. It is uncommon in the county, and uncertain in its localities.

*Viola pumila* or *canina*?—Our common violets have got into a confusion of names, and I am scarcely satisfied about them. The following description applies to the violet that is plentiful on and about Malvern Link and on the Hills:—Leaves cordate-oblong, somewhat hastate blunt at the end, slightly mealy, stipules smooth cut at the top, much shorter than the petioles; corolla blunt, yellowish-green, lateral petals hairy at base, strongly marked with divergent purple lines. This appears to be *V. flavicornis*, Smith; and the small leaves being cordate-oblong or elongated, may be *V. montana*, Linn. But *V. lactea*, Smith, is also considered to be a var. of *flavicornis*, or the latter of *V. lactea*. Both are referred by Professor Babington to *V. canina*, Linn., though as *V. sylvatica* has been commonly known as the "Dog Violet," it would be advantageous to suppress the name *canina* altogether.

*Erodium maritimum*.—Noticed in a new locality on the edge of Hartlebury Common, by the Rev. J. H. Thompson, June, 1867.

*Medicago denticulata*.—Several plants of this were stated to be seen growing "in a field belonging to Mr. Bickley, Moseley Road," Moseley, near Birmingham, in 1866. This was reported and a specimen exhibited at a meeting of the Birmingham Natural History and Microscopical Society, by Mr. J. Morley, jun. He has affirmed the fact in a letter to Mr. W. Mathews, but uncorroborated by the *Medicago* itself, which, if correctly determined, must be presumed to be a straggler.

*Lathyrus sylvestris*.—Still abundant (1867) on the south side of Helbury Hill, near Worcester, where a narrow belt of the old wood yet remains.

*Potentilla verna*.—Lost near Little Malvern by Mr. Johnson's intrusive operations on the hills, but the Rev. J. H. Thompson found it in some abundance this spring, with Dr. Fraser and myself, between "the Gullet" and the Obelisk Hill. Also on the rocks at Chance's Pitch.

**ROSES.**—The Roses of the *Canina* group have not been distinguished in the tabulated list, and require close investigation if the names applied by Mr. Baker in his enumeration of British Roses will remain for any time. I fear these canine forms of roses run into each other, and the adoption of the continental nomenclature will now place the Roses on the same level with the *Rubi* as to difficulty of designation. I sent some Worcestershire Roses to my



friend, the Rev. Andrew Bloxam, of Twycross, who has taken the Roses up with his usual enthusiasm, and prepared a few fasciculi for sale to botanists. I learn from him as under:—

*Rosa tuteiana*, Leman, must now designate our old friend the common glabrous-leaved "canina."

*R. dumabi*, Beckst., includes *sarmentacea* of Woods, and *glaucophylla* of Winch. This we certainly have.

*R. urtica*, Leman, is the old *Forsteri*, of Eng. Bot., and *collina*  $\beta$  Woods—petioles and ribs beneath hairy. Not uncommon.

*R. dumetorum*, Thuill.—Petioles villose, and the leaves hairy on both sides. This we surely possess.

*R. Andevagensis* and *R. verticillacantha* are said to have their peduncles and calyx-tube "more or less aciculate and setose." To one of these probably must my "*glaucophylla*" be referred.

*R. tomentella*, Leman.—Specimens of a rose, with hairy and setose petioles, the leaflets hairy and silvery beneath, which I had referred to *R. inodora*, Mr. Bloxam says is truly the above—"a very distinctly marked rose, and cannot be mistaken for any other." This grows in the Malvern and Severn Valley divisions.

*R. Blondeana*, Rip., is a very hairy-leaved rose that I have gathered near Caernarvon; and I believe to have collected the same in the vicinity of Little Malvern. The tomentose resinous-leaved roses, remain with their names I presume unchanged.

*Sedum dasyphyllum*.—This must be added to the Malvern division, on the information of Mr. J. S. Haywood, who found it growing on an old wall upon the Old Storage Hill (1867).

*Eryngium campestre*.—This very rare plant was gathered in the month of August, this year (1867), by the Rev. Phipps Onslow, and shown to me by him. He gives the locality as between Tedstone-de-la-Mere and Upper Sapey, on the border of the counties of Worcester and Hereford. It may therefore possibly grow in both counties, and I take the benefit of the doubt. It has never been before indicated in either county.

*Feniculum officinale*.—The Fennel has recently established itself on the marl bank that forms the northern side of Rainbow Hill (formerly Red-House Hill), on the rise towards the Cemetery, under the high hedge. It was not there formerly.

*Sambucus Ebulus*.—The nauseous but conspicuous Danewort was shown me by my friend, the Rev. W. S. Symonds, growing in great profusion in a pasture adjoining his church at Pendock—perhaps a relic of Danish occupation there.

*Erigeron acris*.—I have found a new locality for this at the northern base of the Herefordshire Beacon, Malvern division.

*Hyoscyamus niger*.—On the castle tump at Castlemorton, a fresh locality for this lurid fugitive plant, that delights to make its home in a rubbishy spot. Curiously enough it sprang up in the abandoned frames left about the grounds after the Arboretum at Worcester was sold for building purposes in 1867. Also very fine about the forsaken trenches of Elmley Castle.

*Scrophularia Ehrharti*, so named by the late Dr. Streeten in Herb. Nat. Hist. Soc., Worcester, Mr. Westcombe states to be wrong, and it, therefore, still requires to be certainly detected in Worcestershire.

*Chenopodium murale* may have at least the figure 2 placed against it in the Severn Valley, as I noticed it among the weeds that came up (amidst quantities of *Solanum nigrum*) in the beds of the abandoned Worcester Arboretum. Mr. Westcombe says that it often appears as a weed in his garden.

*Daphne mezereum*.—I have received a living plant of this sent me by the kindness of Mr. J. S. Haywood, from the wood at Little Shelsley, which is still a productive locality for it.

*Ceratophyllum submersum*.—Whether this (the unarmed) Hornwort is the more common species I am not prepared to say, but it has been more fre-

quently observed in Worcestershire. Where once established in a pond it chokes it up more densely than the American water-weed. Recently I have observed it as filling the little mill-pond at Gregory's Mill, Claines, near Worcester.

*Polypodium Dryopteris*.—New and extensive quarries have smothered the oak fern in its once undisturbed home in the stony glen between the North and End Hills, Malvern; but I have found it in another locality on the Worcestershire Beacon, which I shall not particularly indicate that it may rest undisturbed.

*Ceterach officinarum*.—This is very rare in the Malvern division, and I feared it was obliterated; but this year (1867) I noticed it on a stone wall bounding one of the new roads below Malvern eastward; and Mr. J. S. Haywood has met with an old wall not far from Bridges-stone Mill, on the Old Storage, where it was to his surprise rather plentiful.

*Botrychium lunaria*.—The Moonwort has become rare of late years in Worcestershire, and is difficult to detect, but Mr. W. Mathews, jun., in a note to me dated June 21st of this year (1867), tells me that he has found it on the Upper Bromsgrove Lickey, not far from the Obelisk, "in abundance, almost in profusion, and some of the specimens were the finest I have ever gathered." Thus my friend with whom I started in the botanical chase over the coverts of Worcestershire, after many an exciting run, joins me close up at the death. Other members of the Club must now follow the sportive flight of the thistle-down, and find out new localities for old plants, or trace the wanderings of immigrants from other countries; for changes will be ever occurring with every year, while commerce introduces novelties, copses are cut down, agriculture advances, or neglect and abandonment anywhere prevails.





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